

MAY 8 '46

THE

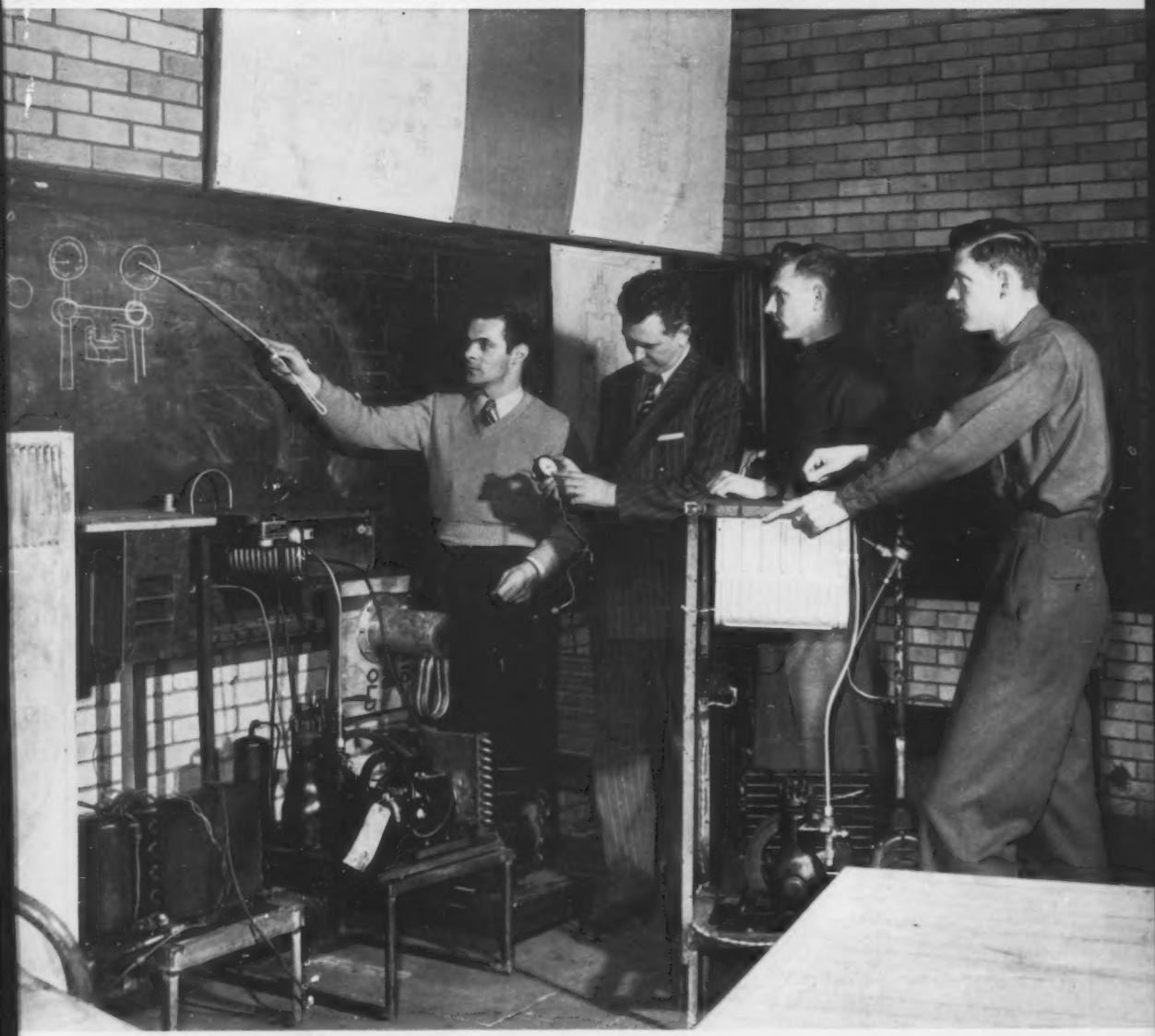
MAY, 1946

Refrigeration

AIR CONDITIONING
EQUIPMENT

INDUSTRY

MERCHANDISING • INSTALLATION • MAINTENANCE

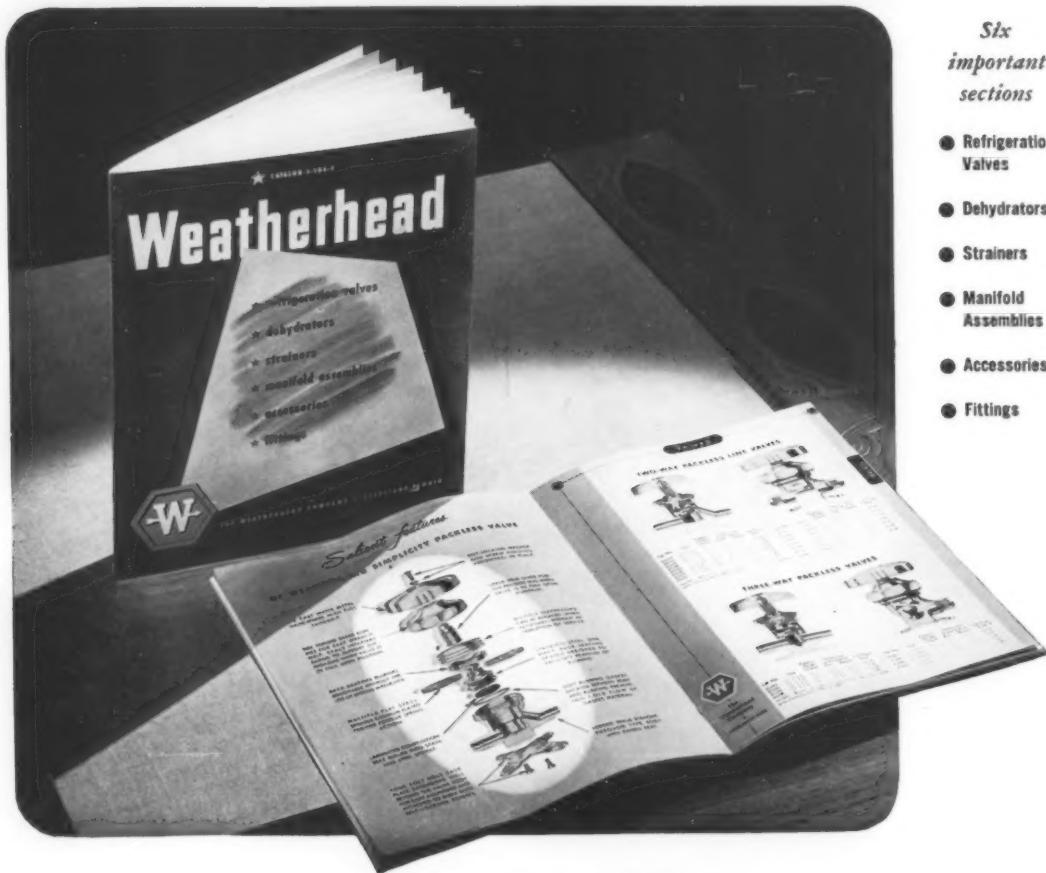


Circulation of This Issue 23,021

Why you will want this new Data Book!

If you are connected with the refrigeration industry . . . as a designer, engineer, purchasing agent, or service-man, you'll want a copy of this new catalog. For here is a quick, easy-to-use source of detailed information on Weatherhead parts designed especially for refrigeration and air conditioning applications.

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- Dehydrators
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- Accessories
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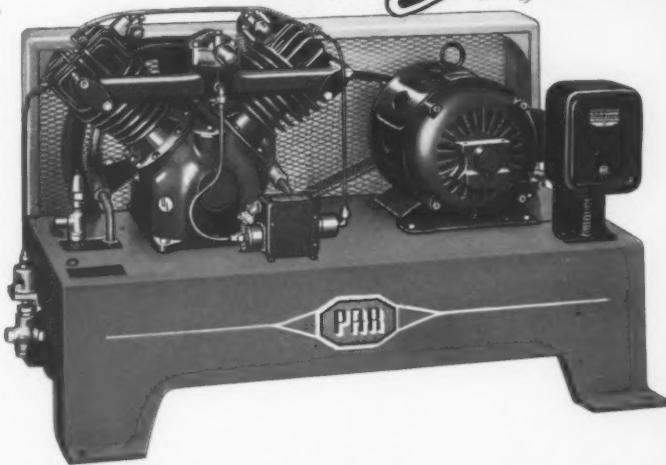
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In PAR there's more
than meets the Eye...
Compare... know what's
on the inside... know
why it pays to buy PAR!

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ALSO DUAL-TEMP REFRIGERATORS • HOME FREEZERS • RADIOS . . . ADMIRAL CORPORATION, CHICAGO

THE

Refrigeration

INDUSTRY

VOLUME 3, No. 5

MAY, 1946

THIS MAGAZINE has no
official affiliation with ANY
group, society or association.

THE COVER . . . Interested in the widespread possibilities that air conditioning and refrigeration have to offer, returning World War II veterans are entering training schools in increasing numbers. This scene at East Technical High School, Cleveland, where a full-time day class has been established, is typical of what's happening in several cities from coast to coast. See story on page 52.

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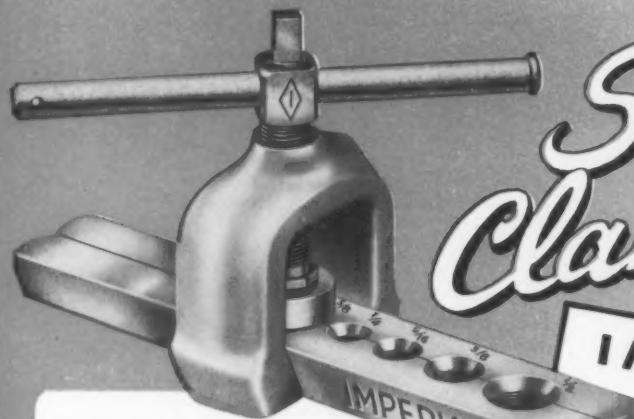
CCA

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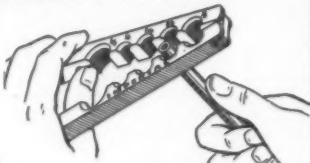
FASTER AND EASIER FLARING BECAUSE IT'S



Self-Clamping

IMPERIAL
NO. 295-FS
FLARING
TOOL

HERE ARE THE THREE
SIMPLE STEPS IN MAKING
A FLARE



1 Spread bar and insert
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2 Close bar and slide
yoke over hinged end of
bar.



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over tubing and turn
compressor screw down
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for designers of
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PREVENTS OVERLOAD WHEN STARTING

A "cartridge" inside limits suction pressure and keeps the valve closed until the pressure drops below the valve setting. This prevents burned-out motors—often permits use of smaller condensing equipment.

Parts are interchangeable, so that pressure, capacity and super-heat can be changed in the field.

Available at your wholesaler's for smaller capacity commercial refrigeration. Ask for our Bulletin 152.

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of Thermostatic Expansion
Valves; Pressure Regulating
Valves; Solenoid Valves;
Float Valves; Float Switches.



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UNIT COOLERS

FOR 1946

NEW JUNIOR UNIT COOLER



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ESPECIALLY DESIGNED FOR INDUSTRY

Provide Maximum
Air Conditioning Comfort
with Dependability
and Economy

75 horsepower Century SCH motor
provides the power for comfortable
air conditioning.



Use Quiet Starting and Operating
CENTURY SCH MOTORS

Because Century type SCH motors are ruggedly built, with accurately machined feet, rigid frame and end bracket construction and carefully balanced rotors, they are remarkably free from vibration. This feature plus unique bearing bumpers, large shafts and smooth diamond bored bearings makes Century compressor motors unusually quiet starting and operating. Their rugged construction assures long satisfactory service.

In addition, these motors have the necessary high torque to start against heavy compressor loads and bring them up to speed quickly, but smoothly and quietly.

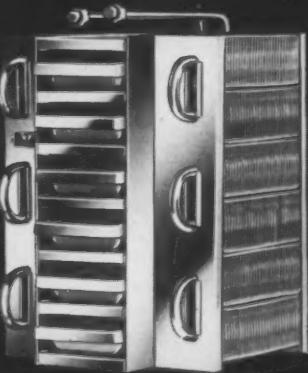
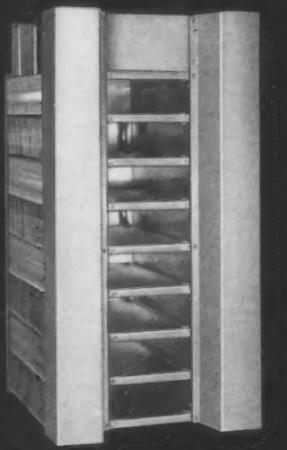
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SOLD THROUGH LEADING REFRIGERATION
SUPPLY WHOLESALERS

MAY, 1946



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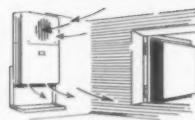
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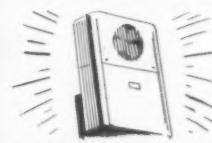
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CIRCULATION — Warm air is sucked in from top shelves in reach-in coolers. Cuts down air stratification.



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FREON
REG. U. S. PAT. OFF.

safe refrigerants

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HERE'S WHY
Rotary Seals
ARE FIRST CHOICE OF
REFRIGERATION SERVICE
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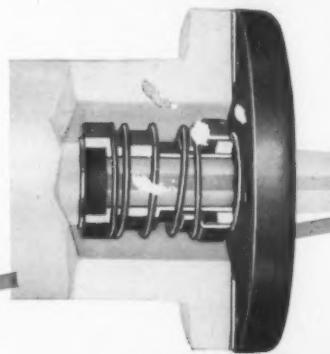
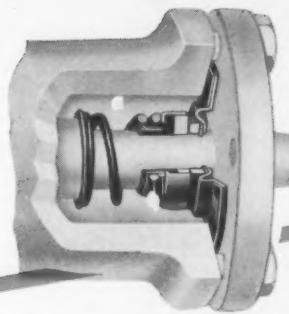
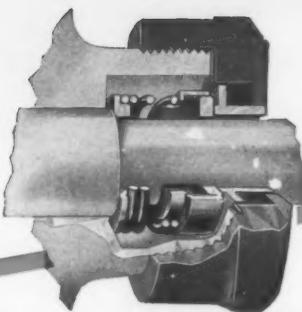
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The ROTARY line is the most complete on the market . . . whether you specialize in domestic or commercial service. They are available at all leading jobbers. No shopping around to do . . . get them when you want them.

ALWAYS USE ROTARY SEALS

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Better **HEAT EXCHANGE**
EQUIPMENT for
AIR, GASES AND LIQUIDS

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Spasaver & Flo-Cold

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Petroleum

—gas coolers and specialized heat exchange units

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drayer - hanson
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COMPLETE FACILITIES FOR ENGINEERING, DESIGNING, MANUFACTURING,
HEAT EXCHANGE EQUIPMENT.

2 WAYS TO BE ON THE SAFE SIDE



1. WEAR BOTH BELT AND SUSPENDERS
2. PROTECT THE JOB WITH HENRY PRODUCTS



SNAP ACTION DIAPHRAGM
RELIEF VALVE

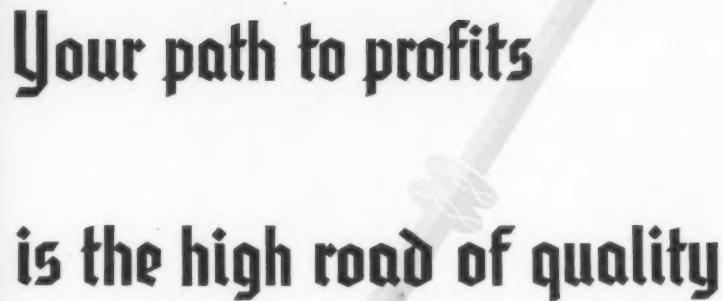
Instantaneous pressure relief and fast, positive seating action with small differential between opening and closing pressures. Can be set to relieve at initial leak pressures ranging from 90 pounds to 300 pounds per square inch. Another famed Henry Product serving the industry.

● The simplest job brings grief if equipment lets you down. That's why on all refrigeration and air conditioning jobs, it pays to be on the safe side, using HENRY Valves, Driers and Strainers. Henry manufacturing "know-how" plus your installation skill is the right combination to hold up your reputation and prevent exposure to customer criticism. Henry products not only make work go smoothly, they protect you against part failures and costly call-backs, assure more satisfaction to your customer and more profit to you.

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THE REFRIGERATION INDUSTRY



Your path to profits
is the high road of quality

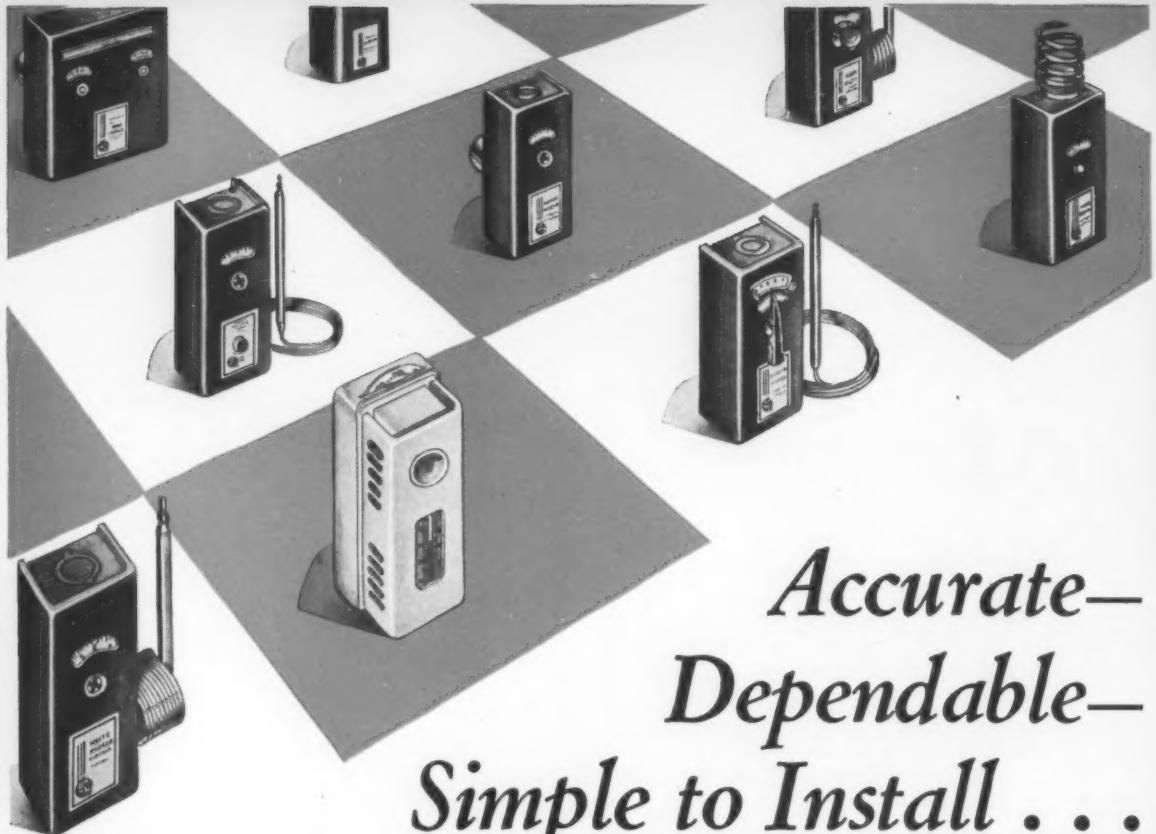
Mills Compressors and Condensing Units are milestones on your way.

MILLS INDUSTRIES, INCORPORATED • REFRIGERATION DIVISION

4100 FULLERTON AVENUE • CHICAGO 39, ILLINOIS

MAY, 1946

15



*Accurate-
Dependable-
Simple to Install . . .*

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Specified BY MANUFACTURERS . . . Preferred BY SERVICE MEN

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... and your trade will thank you for saying . . . "Use Copeland." Protect the reputation that took you so long to build by selling the best in refrigeration. Dependability, low price and operation economy... are only a few reasons why everyone wants Copeland units.



Copeland

DEPENDABLE *Electric* REFRIGERATION



Ask for
the Complete
Copeland
Catalog

COPELAND REFRIGERATION CORPORATION, SIDNEY, OHIO

MAY, 1946

Double Feature!

THAWZONE

PATENTED

The PIONEER FLUID DEHYDRANT

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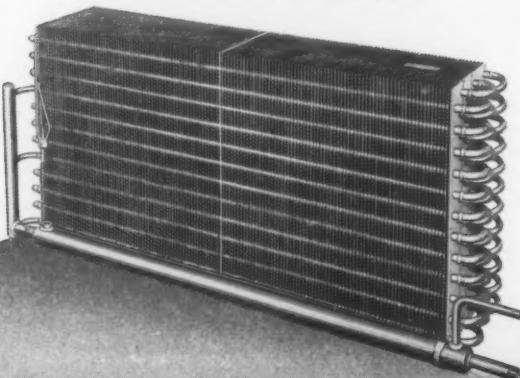


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Every summer he steals countless hours from every type of business — productive time lost by heat-fatigued workers . . . Air conditioning — made more efficient by Marlo "BALL-BONDED" Coils — will promote year-round peak production. Our engineers will gladly help select proper equipment.

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Low Temperature Apparatus



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MARLO COIL COMPANY

ST. LOUIS 10, MISSOURI

BRUNNER REFRIGERATION HELPS YOU TO SERVE BETTER



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... a big protecting job for refrigeration!

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Whether your requirements call for $\frac{1}{4}$ hp. or 25 hp. units, air-cooled or water-cooled, there's a Brunner Condensing Unit designed to meet them. They are described and illustrated in the Brunner Refrigerating Equipment Catalog. Write for your copy.

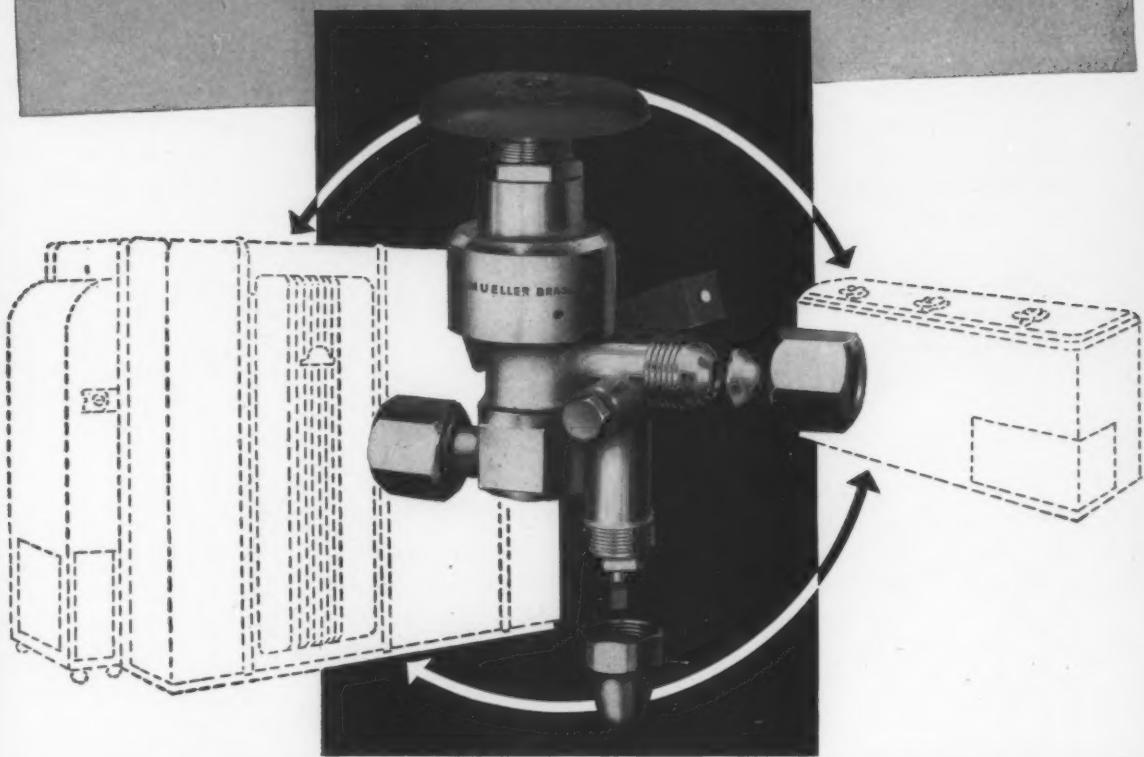
**BRUNNER
MANUFACTURING COMPANY
UTICA 1, N. Y., U. S. A.**



FOR MORE THAN 40 YEARS THE SYMBOL OF QUALITY

MUELLER BRASS CO.

Two-Temperature Control Valve



● The Mueller Brass Co. Two-Temperature Control Valve is used in a refrigerating system where one compressor cools more than one unit and where it is desirable to more accurately control temperatures in the various units. It closely maintains a pressure in the coil at a level above the operating pressure of the machine.

An exclusive feature of this valve is the provision for by-passing the automatic valve in case it is desired to pump all the refrigerant from the coil. By means of this by-pass arrangement, the automatic valve can, in effect, be cut out of the system and the coil opened directly to

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There is no limit to the number of valves that can be installed on one system. When several boxes are to be maintained at different temperatures, the Two-Temperature Valves are installed on the higher temperature units.

An oval handle, which is independent of the automatic closing feature, provides manual closing and eliminates the use of a separate line valve.

Valves are furnished 1/2" and 5/8" flare.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

WAGNER Repulsion-Start Induction Motors Are Long-Lived, Economical, and Dependable

Wagner type RA repulsion-start induction motors give years of reliable, trouble-free service, because dependability is built into every motor.

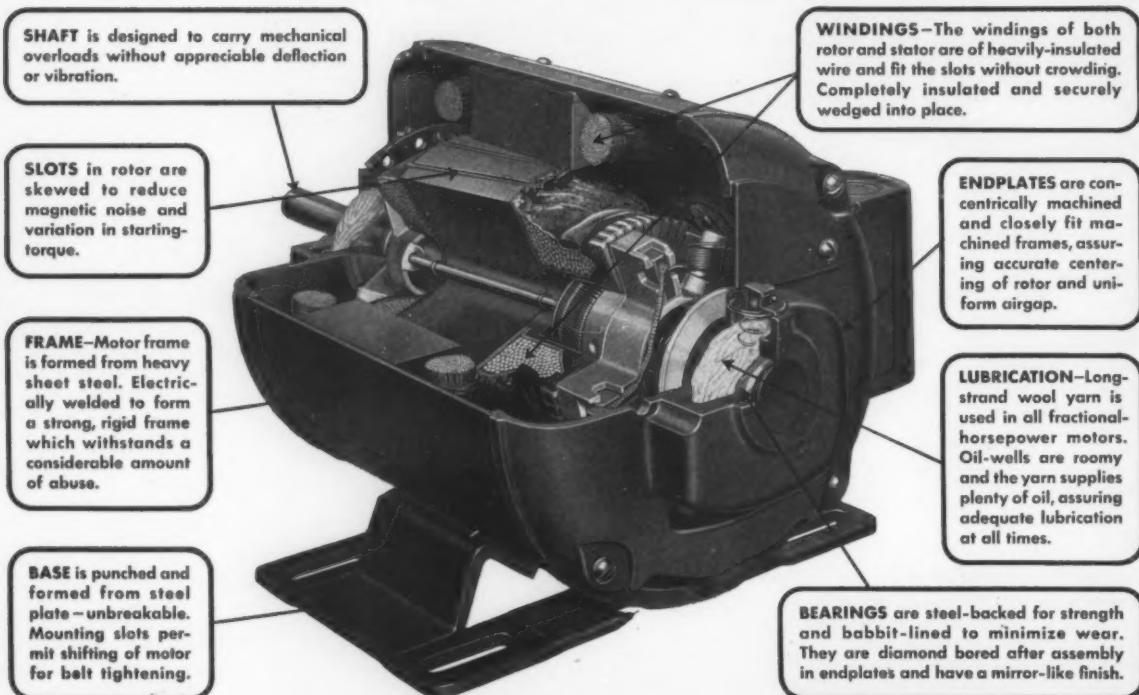
Careful engineering has reduced wear, vibration, and noise of operation to a minimum. Many important construction features such as sturdy welded steel frames and well-insulated windings securely held in place, add to the ruggedness of the motors without sacrificing compactness or efficiency.

Wagner type RA motors embody all the important improvements in single-phase motor design. This means that the user of RA motors gets the best

motors for the job with long life and dependability built into every part.

Type RA motors are available in $\frac{1}{8}$ to 15 hp; sleeve or ball-bearing; horizontal or vertical; open, drip-proof, and totally enclosed; rigid, resilient, or flange mountings.

A few of the many Wagner construction features are shown below around a cut-away view of the type RA. For complete description of Type RA motors, write for Bulletin MU-185, and address your inquiry to Wagner Electric Corporation, 6442 Plymouth Avenue, St. Louis 14, Mo.



M46-12

Consult Wagner Engineers on all Electric Motor Problems

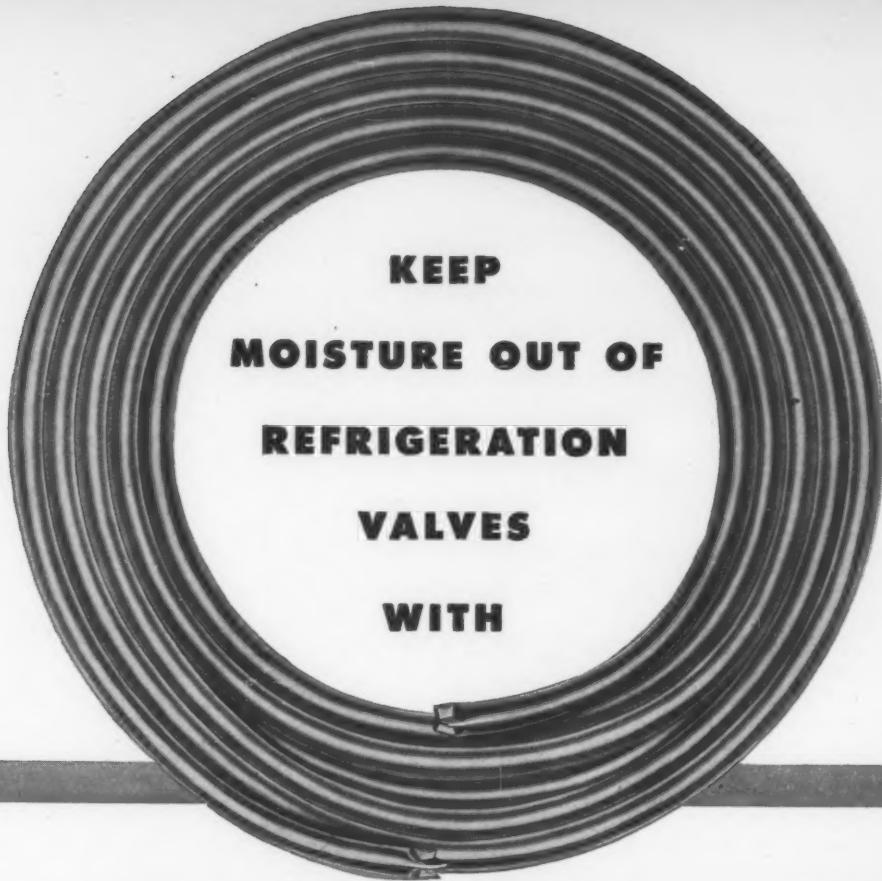
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REVERE DRYSEAL TUBE

EVEN a minute quantity of moisture can cause an expansion valve to "stick"—can make a valve lose control—can freeze in the flow area of a valve and partially or wholly block the flow.

That is why Revere Dryseal Copper Tube comes to you dehydrated and sealed at both ends—so that you can keep moisture *out* of your installations.

Made for refrigeration, air conditioning, heat control, bottled gas, and other exacting services, Revere Dryseal tube is dead soft for easy handling, and comes

in sizes from $\frac{1}{8}$ " to $\frac{3}{4}$ " O.D., with .035" wall. It is standard in 50-foot coils. Sold by Revere Distributors in all parts of the country.

REVERE
COPPER AND BRASS INCORPORATED

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Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N.Y.—Sales Offices in Principal Cities; Distributors Everywhere

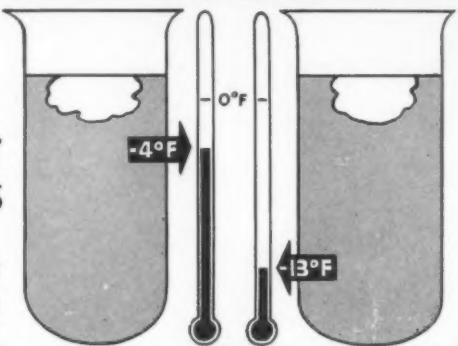
Listen to Exploring the Unknown on the Mutual Network every Sunday evening, 9 to 9:30 p. m., EDST.

The Ansul Research Staff
CONTINUING REPORT ON:

WAX SEPARATION FACTS

**SAME OIL
but
DIFFERENT
SHIPMENTS**

An example of wax separation in two samples of presumably the same oil. Both tests were prepared with a 10 per cent concentration of oil in the refrigerant. Sample on the left separated wax at -4° Fahrenheit while the sample on the right did not separate wax until -13° Fahrenheit. In purchasing oils for low temperature refrigeration, specify wax separation temperature.



by the
Ansul
Wax-Oil
Separation
Method

● The temperature at which wax separates from an oil in oil-refrigerant mixture is influenced by three determining factors:

1. The nature of wax in the oil.
2. The amount of wax in the oil.
3. The amount of oil in the oil-refrigerant mixture.

Different oils possess different wax separation characteristics.

The nature and amount of wax content vary in different oils and may even vary in different samples of supposedly the same oil taken from different shipments.

These inconsistencies confuse the engineer in his

efforts to select or recommend suitable lubrication for low temperature refrigerating systems and, to alleviate this condition, Ansul Chemical Co. is ready and anxious, at all times, to co-operate with refrigeration engineers and refrigeration service engineers.

REMEDIES

To eliminate wax trouble in expansion valves and coils:

1. Use an oil which separates little or no wax from its mixture with the refrigerant at the operating temperature of the valve.
2. Install an oil trap to cut down the amount of oil (and consequent wax) circulating with the refrigerant.

SEND FOR THIS BULLETIN
An informative reprint, "The Separation of Wax from Oil-Refrigerant Mixtures," will be sent on request. No obligation... just address...

*REG. U. S. PAT. OFF.



ANSUL JOBBERS are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.

FOR EXAMPLE:

Samples of ice machine oils, submitted by users of Ansul Refrigerants to Ansul Jobbers, are tested by Ansul laboratories without charge by the Ansul Standard Wax-Oil Separation Method. This approved method, developed and standardized especially for use in connection with oils used in refrigerating systems, provides an accurate determination of the amount of wax which separates from an oil at low temperatures.

Ansul refrigerants are available at leading distributors everywhere.

ANSUL CHEMICAL COMPANY

REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINETIC'S "FREON-11," "FREON-12," "FREON-21," "FREON-22" AND "FREON-113"

Another

KEROTEST.....

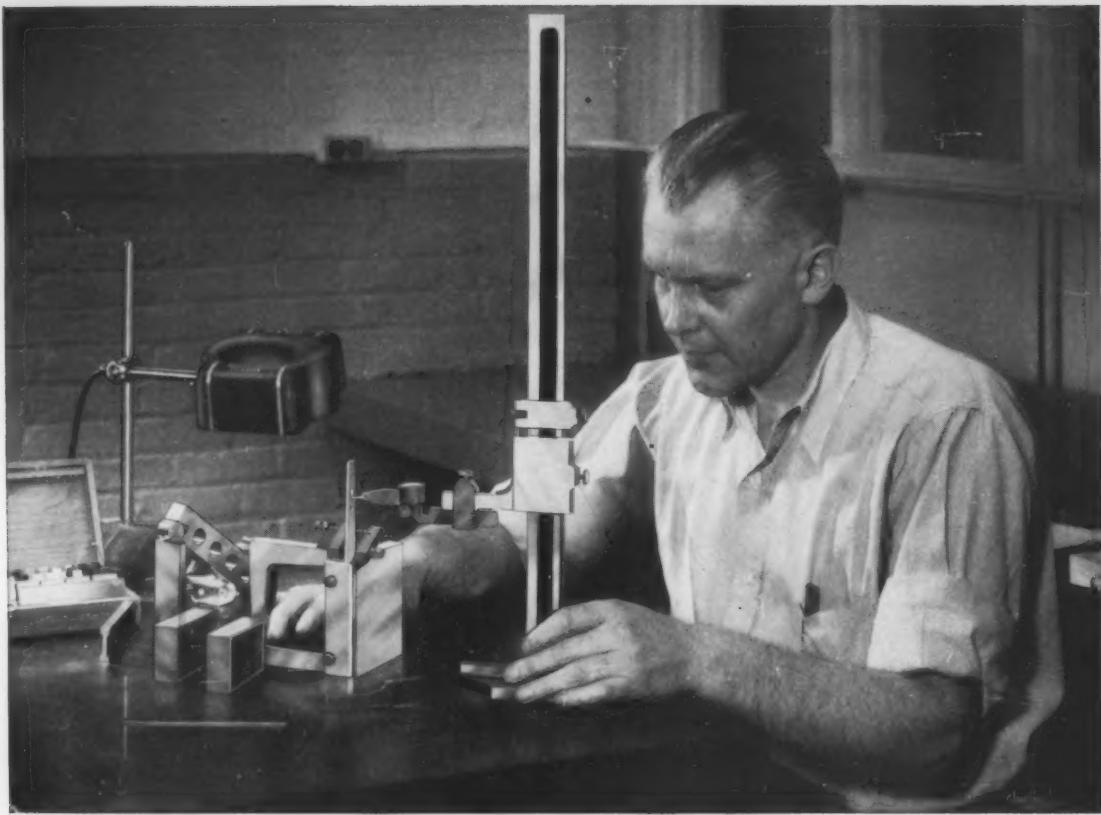
KEROTEST was among the FIRST manufacturers to recognize the Air Conditioning and Refrigeration Wholesaler and to distribute Kerotest Products through these Wholesalers, because of their excellent service facilities ... The Kerotest Policy is to continue this satisfactory method of distribution

sf.



MANUFACTURING COMPANY • PITTSBURGH, PENNA.

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"Fault Finder!"

It's his *supercritical* attitude that makes this tool inspection engineer such a valuable PENN employee!

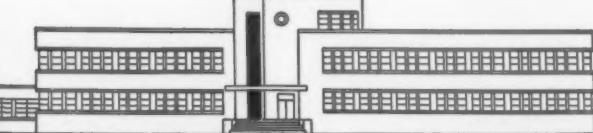
He is, of course, only one of many experts in Quality Control and inspection employed in PENN's modern factory . . . men who are paid to find fault . . . to assure you *the best controls that can be built*.

Here this engineer works with the finest commercial measuring or gauging devices obtainable. He inspects carefully a new part used in PENN Controls to determine not only the accuracy of the piece but also of the die from which it was made. To him the reputation of PENN Controls is a

serious responsibility. Consequently, every control he tests must meet rigid specifications . . . or be discarded.

You may rest assured that these men who watch over PENN quality will always be unwilling to compromise . . . will always insist on PENN Refrigeration Controls being "right" before they leave the factory. Controls are available for temperatures as low as 150° F., and for pressures as low as 28" vacuum. Ask your jobber about them. *Penn Electric Switch Co., Goshen, Indiana. Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ontario.*

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

B'TU'S

News • Laws • Trends

● **Kelvinator Goes West.** George W. Mason, Nash-Kelvinator president, has announced purchase by the company of a plant at El Segundo, Calif. for the production of Kelvinator and Nash products. The new plant, which will serve the entire western seaboard region, will supplement N-K facilities in Michigan and Wisconsin. Purchased from the War Assets Corp. at an undisclosed price, the plant has 75,000 sq. ft. of floor area, and was operated during wartime by North American Aviation, Inc.

● **Price Boost Expected.** An industry-wide increase in manufacturers' prices of household mechanical refrigerators is expected to be approved soon by OPA, but nothing is known yet as to who will be expected to absorb it, when and if it comes. The recently approved price increase for automobiles, most of which OPA expects distributors and dealers to absorb, is being strongly contested by retailers on its present basis. Determination of the automobile controversy may set the pattern for other consumer goods price increases.

● **Cotton-Lined "Reefer".** Illinois Central Railroad is putting into commercial use, for test purposes, a refrigerator car insulated with cotton. The cotton has been specially treated to be flameproof, sterile, immune to rot, mold or fungus and non-absorbent to moisture. Formed into batts, it is surfaced with kraft paper and aluminum foil. Saving in weight by the new insulation, the railroad estimates, will be around 1½ tons per car. Insulation thicknesses will vary from 1 to 3 inches.

● **Refrigeration in Germany.** The German air conditioning and refrigeration industry is from 5 to 10 years short of American standards, according to a report prepared for the Army's technical industrial intelligence committee by Gunnar Berg, air conditioning and refrigeration engineer for Westinghouse Electric International Co. Here are some interesting highlights of the report:

Railway car air conditioning hadn't gone past the experimental stage; factory air conditioning was seldom utilized, even in underground plants; "packaged" air conditioning hadn't been touched as a market, and neither had any individual room air conditioners been developed; electric water coolers were not manufactured either.

Generally speaking, night clubs, restaurants, theaters and hospitals accounted for most air conditioning installations. The Reichchancellery in Berlin was partially air conditioned, but the Reichstag wasn't—the war stopped plans for that.

Only one company offered a comparatively complete

commercial refrigeration line. In the household field, design and construction was similar to what ours was 10 years ago. Cabinets used synthetic insulation (called "Iporka"), steel hardware instead of brass, nails for screws, inferior synthetic lacquers. Copper was on the "verboten" list three years before the war, and Freon refrigerant wasn't utilized in Germany until 1939.

● **Quick-Frozen Coffee.** A quick-frozen coffee-paste has been developed by a west coast producer for marketing through frozen food channels. The product, it is claimed, captures roaster-fresh flavor right at the ovens and retains it indefinitely under low-temperature storage conditions. The company, which also produces standard coffees, expects that eventually all of its processing facilities will be devoted to the frozen product.

● **Picnickers' Pic-a-back.** New on the market is a 25-pound portable frost-box to keep foods and beverages at low temperature for picnickers and traveling motorists. Detachable cooling compartment carries 13½ pounds of either dry ice or water ice, and the whole package is 24x16x15 inches, with 2 inches of insulation between outer and inner compartments.

NEXT MONTH

Beginning with our June issue, we will present a series of comprehensive articles covering the fundamentals of air conditioning, and the relationship of the various functions of an air conditioning system. Material will cover:

The Atmosphere; Humidity of the Atmosphere; Air Pressures; Air Volumes; Heat Tables; The Psychometric Chart.

Watch for it; it will be well worth your reading.

● **"Super" Sales Centers.** Tough point-of-sale competition for refrigerator and other appliance business is in the offing for medium and small dealers. If you doubt it, just look around at the "super deluxe" appliance centers that the larger merchandisers, like department stores, are putting up.

These sales departments are being given ground-floor location, deluxe appointments, and they'll cover appliance merchandising from soup to nuts—including separate refrigerator displays, model kitchens, and full-scale "schools" and other promotional aids. One midwest department store is sinking over \$300,000 in a separate "appliance annex" which includes an auditorium seating 150 persons, plus meeting-room facilities for women's clubs.

Medium and smaller dealers won't be able to match the big stores in promotional splashes of this size, but some pretty powerful volume-building ideas will be called for if they're to hold their own in the bid for business.

● **Gas Refrigerator Outlook.** Another sidelight on the competitive situation that can be expected before too long is the recent statement by W. Carl Wolf, managing director of the American Gas Association, that gas refrigerator requirements presently are estimated at more than 2 million units. Demand for gas cooking ranges, to look at a neighboring appliance field, are set at about 4 million units.

BLUEPRINT FOR

A COMPLETE and integrated kitchen planning service can be a potent help in building household refrigerator sales volume . . . but it takes an experienced specialist in this field to really do the job right.

That is the considered opinion of C. C. Robinson, head of C. C. Robinson Co., "The General Electric Store" in Columbus, Ohio. And Mr. Robinson's voice is that of experience. An old-line refrigerator dealer, he is a veteran of all types of high-powered appliance promotions. And at one time he tried handling his own kitchen planning service—with results that he'd rather forget.

"I am a graduate architect," Mr. Robinson declares, "but despite that fact I wouldn't even think of trying to plan a housewife's kitchen for her. That's definitely a job for a kitchen planning specialist."

A Job for a Specialist

And just such a specialist is M. A. Carter, who is now working hand in hand with Mr. Robinson in a carefully coordinated program of complete kitchen planning and aggressive appliance merchandising.

Mr. Carter's words echo Mr. Robinson's sentiments in regard to kitchen planning. "This type of work" he asserts, "is definitely a specialty activity, and it calls for a very highly developed and highly individualized approach upon the part of the salesman. For when you start tinkering with the kitchen, you are dealing with the thing that is nearest and dearest to the average housewife's heart.

"You really have to know the housewife and understand her problems," he continues. "In my years of designing and installing kitchens I've done everything from minding a



Mr. Robinson and Mr. Carter talk over plans for a joint sales promotion laid out on Mr. Carter's drafting board.

young mother's baby while she runs out to the store to counseling an aging wife on how to hold her wayward husband. I've measured and re-measured, planned and replanned, designed and modified kitchens to suit a finicky housewife's every whim . . . but I've sold a lot of complete kitchen units in the process."

Prior to the war Mr. Carter had spent 15 years in the kitchen planning business. He had operated his own specialty shop for this purpose. And Mr. Carter's kitchen planning establishment, it so happened, was conveniently close to Mr. Robinson's appliance store.

"If you can't beat 'em, join 'em" is an old and proven maxim. So when Mr. Robinson finally "threw in the towel" as far as his own at-

tempt at kitchen planning was concerned, he decided to heed this sage bit of advice and proceed to enter into a working agreement with Mr. Carter.

Under this set-up, when Mr. Robinson encountered any refrigerator customers who were interested in complete kitchen layouts he promptly referred them to Mr. Carter. And Mr. Carter, who simply designed kitchens and sold no appliances, would send his customers to Mr. Robinson's shop to buy the refrigerator and other items which they wished to incorporate in their new kitchens.

Teamwork Works

This arrangement worked reasonably well, it seems, although the co-ordination was not always as close as it should have been to achieve maximum results for either party.

When the war came along, however, Mr. Robinson of course was unable to get new refrigerators to sell. And Mr. Carter, unable to get any of the cabinet units or other materials which he desperately needed for the assembly of his planned kitchens, closed up his shop and went to work in a war plant.

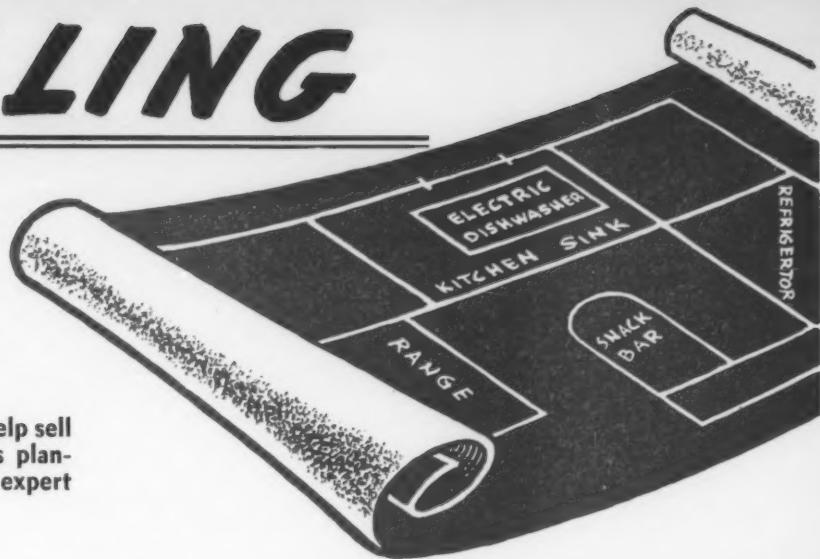
With the war's end, Mr. Carter got the yen to get back into his old line of



At the right is the kitchen of one of Mr. Carter's customers before he started to work on it. The drabness and inefficiency of this room are all too obvious. In all respects, it is "just another kitchen." Now look at the matching photo.

SELLING

Kitchen planning CAN help sell refrigerators . . . IF this planning is handled by an expert



work and started looking around for a location. But with the real estate market as fully saturated in Columbus as in most other metropolitan areas, it proved to be a pretty hopeless and fruitless quest.

Mr. Robinson, on the other hand, was once again beginning to get refrigerators and other household appliances to sell—but like the burnt child who dreads the fire he was still shying away from anything which smacked of kitchen design.

So the obvious happened. Old friends Robinson and Carter got together and decided to pool their specialized talents and abilities and utilize them to mutual advantage.

Under their present arrangement, Mr. Carter operates his kitchen planning and sales activities out of specially designated quarters in the Robinson store, although the two organizations still retain their separate identities. Mr. Robinson gives Mr. Carter floor space and display facilities, and in return receives a certain percentage of the gross income of Mr. Carter's kitchen planning service. He also, of course, has the inside track when it comes to selling refrigerators and other kitchen appliances to Mr. Carter's kitchen customers.

Mr. Carter has the franchise for two lines of kitchen cabinets, Napanee

and Art Metal, and both of these lines are incorporated in the two complete kitchen displays which the Robinson store maintains on its sales floor.

His kitchen planning activities are centered in an office and a drafting room located on a small mezzanine at the rear of the Robinson store. Here he is thoroughly equipped to handle kitchen orders and to prepare complete and detailed layouts for his customers.

Model Kitchen Displays

The two complete kitchens on the sales floor, one of typical "U" shape layout and the other designed in standard "L" shape form, serve as "on the spot" clinchers both for Mr. Carter's kitchen prospects and for Mr. Robinson's prospective appliance customers. Here both types of potential purchasers can see with their own eyes just what the salesmen are talking about and vividly visualize just how it would look in their own homes.

Yes, Mr. Robinson is counting heavily on kitchen planning as a means of selling more and better refrigerators, especially when the immediate, pent-up, war-born demand slackens off. And in his coalition with Mr. Carter he is convinced he has the ideal way of handling such a service.



At the left is the same identical kitchen after having been subjected to Mr. Carter's "magic touch." Note the clean-lined modern design and the efficient way the various work centers are tied in to each other. Only the floor covering is unchanged.

..LUBRICATION in low

The second and concluding section of a discussion of compressor design trends as they affect lubrication

By A. F. Brewer

Technical and Research Division
The Texas Co.

WATER in a refrigerator oil can exert several bad effects:

- 1—It can throw off the accuracy of the floc test by creating a false cloud.
- 2—It can contribute to chemical reaction with some refrigerants; or,
- 3—It can become a potential cause of stoppage due to formation of ice particles at the expansion or regulating valve.

Water can be removed from the oil before the latter is charged to the refrigerating unit by blotter pressing which assures of complete removal of suspended moisture from a new oil.

For extreme low temperature service, where it may be desired to remove even dissolved moisture at the time of charging the system with oil, this can be done by vacuum dehydration at elevated temperatures assisted by dry air or nitrogen.

Where a refinery-dehydrated oil has been purchased, the storage must be so planned that the oil will not be exposed to air containing moisture. Petroleum oils readily absorb moisture from the air; a refrigerator oil, therefore, must be most carefully handled.

The Chemical Effect of Water

In an SO_2 system water will react with the refrigerant to form a corrosive acid which can attack certain of the metallic parts of the system.

Water is serious in a methyl chloride system as it may produce corrosion products due to slow reaction of the methyl chloride with water to form hydrochloric acid. Water also

can promote "sludge" formation and copper "plating." It is regarded by authorities as the chief offender in regard to copper "plating."

In systems using any of the "Freon" refrigerants, water beyond the point of saturation may promote reaction to corrosion products. Over long periods of time these refrigerants may slowly react with water to develop acid products to perhaps a sufficient extent to present a corrosion problem.

Significance of the Dielectric Strength*

A high dielectric strength is today used as an indication that a refrigerator oil will not contain moisture to such an extent as to cause trouble.

While the dielectric strength does

not indicate moisture content in terms of percentage by weight, there is some correlation between the two, i.e., an oil of some 30,000 volts dielectric strength may contain as much as 0.01% moisture by weight, a 25,000 volt oil may contain as much as 0.03% moisture by weight.**

Separation of any of this dissolved water by a slight drop in temperature will immediately lower the dielectric strength to 10,000 volts or lower. These quantities in ultra-low temperature refrigeration can be considered harmful.

Satisfactory methods of determination of dissolved moisture contents are an industry need. F. M. Clark of General Electric Co. has contributed some pertinent thoughts in this regard.***

Although the dielectric test has

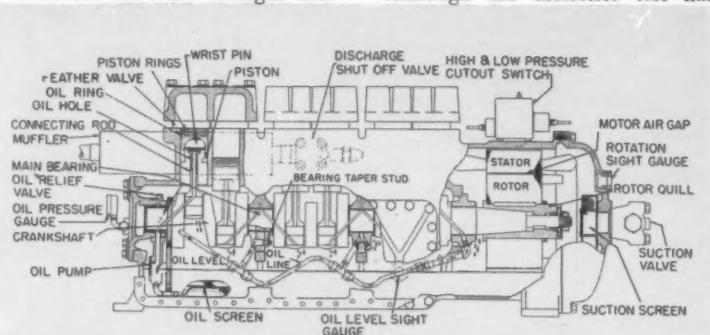


Fig. 7—Internal construction of Westinghouse CLS-850 condensing unit. Via drilled crankshaft and connecting rods, full pressure lubrication is developed throughout.

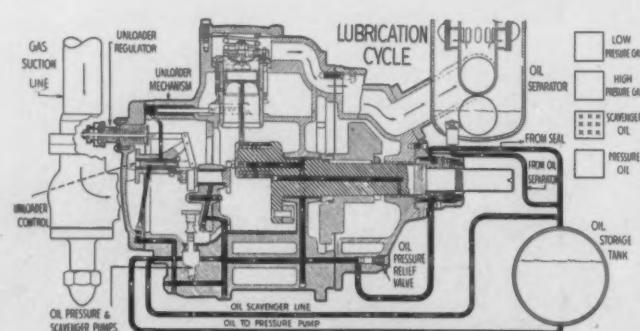


Fig. 8—Lubrication cycle for Chrysler Airtemp radial compressor. Rings and cylinders are protected by a mist of oil developed as oil under pressure escapes from bearing.

*See A.S.T.M. Standard Method of Test (D-117-48) in 1944 Book of A.S.T.M. Standards, Part III, p. 443, "Tests for Electrical Insulating Oils," Dielectric Strength.

**Artic Service News—E. I. duPont de Nemours Co., Mar. 1939 p. 2.

***Water Solubility in High-Voltage Dielectric Liquids by F. M. Clark, General Electric Co., Paper before Am. Inst. of Electrical Engineers. Published in Electrical Engineering, August, 1940.

temperature refrigeration

been adopted as one of the standard tests under which refrigerator oils are purchased, it is in reality a premium test, to obtain which the buyer must pay an added cost per gallon.

This is justified for refrigeration service work where oils are purchased in one quart or one gallon refinery sealed cans for usage in the field, where little if any left-over remains after the seals on the cans have been broken and a machine has received a new charge of oil. By careful handling and minimum exposure to the air while charging the compressor the chance of the oil going off-dielectric by taking up moisture or dirt is remote.

But now consider the manufacturer who buys his refrigerator oil in bulk—in drums or tankcars. Drums can be refinery sealed just like cans, but tank cars have to breathe, so outage is left in the dome for expansion. Also,

expansion space is left in drums.

When such shipping containers are filled, it is no problem for the oil refiner to blotter press to a 25,000 volt dielectric. However, this costs money. The refrigeration machinery builders ultimately pay this cost. Yet, some of them re-blotter press their oils after receiving them, or otherwise make sure that they are dry before charging their compressors.

In turn, some of these builders have realized that they are paying an unnecessary premium for a high dielectric strength oil, when it is such a simple matter to blotter press or dehydrate in their own plants. These builders have found they do not need to purchase on a 25,000 volt dielectric specification upon delivery.

This does not free the refiner from any responsibility in delivering a high quality refrigeration grade oil,

Continued on page 48

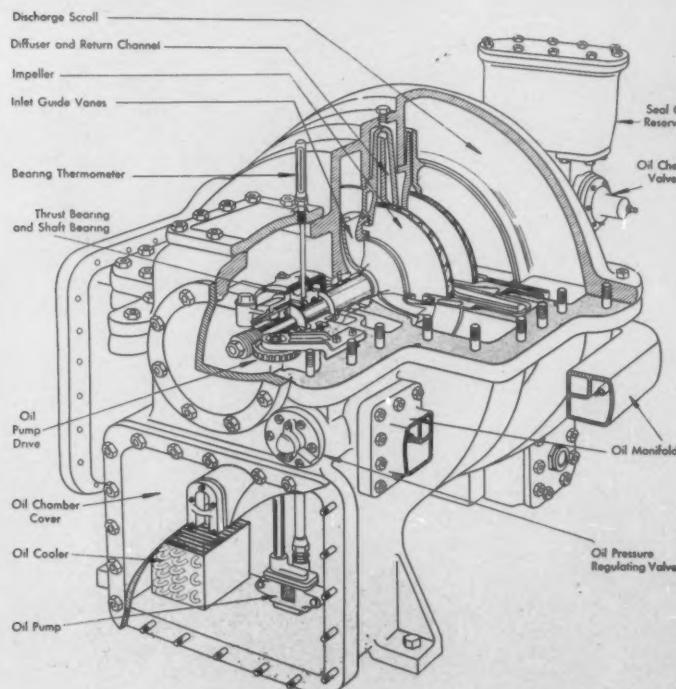


Fig. 9—Oiling circuit for Carrier centrifugal refrigerating compressor. Only four parts have wearing surfaces: shaft bearing, thrust bearing, oil pump, and shaft seal. Note oil pump submerged in reservoir and oil cooler to control oil temperature.

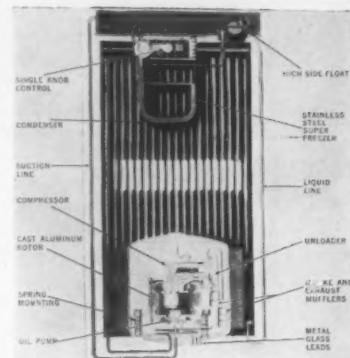


Fig. 10—General Electric refrigerating unit. Compressor is oiled by a two-blade pump which circulates oil from base up through passage in center of shaft.

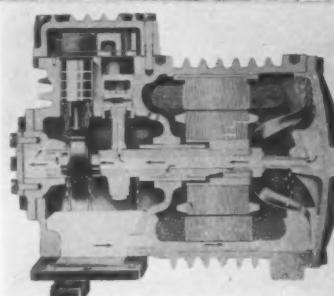


Fig. 11—Oiling circuit of "Coplamatic Twin" refrigerating unit, which employs a distinctive method of developing force feed lubrication without an oil pump. A propeller secured to the eccentric and rotor shaft lifts oil to a reservoir above the shaft center line. Oil is drawn from this supply by centrifugal force.

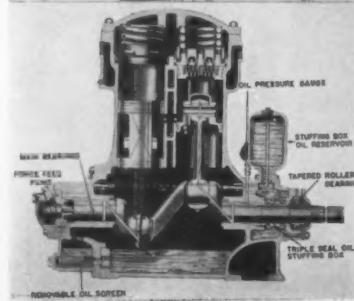


Fig. 12—Cross section of a Vilter Freon-12 compressor showing force-feed oiling system and triple-seal.

THE { WHEN WHERE WHY HOW OF AUTOMATIC

By George H. Clark

A N automatic expansion valve is a device to regulate the flow of refrigerant into an evaporator in such a manner as to maintain a constant pressure in the evaporator during the period the compressor is running. The valve should also close and prevent refrigerant from entering the evaporator after the compressor stops, or if for some other reason the evaporator pressure increases.

The automatic expansion valve was used on most of the early domestic refrigerators. These refrigerators were a step in the evolution of present refrigerators from the ice box. The early mechanical refrigerator often was made up of an ice box with the ice removed and a "brine tank" of almost ice-cake size substituted. The brine tank consisted of a rectangular closed metal tank with a coil of 20 to 50 feet of tubing enclosed and also one or more sleeves in which ice trays were placed in hopes of making ice cubes. Refrigerant temperatures of

10° to 20° were maintained and the temperature controls might operate from 20° to 25° or thereabouts. The brine used was generally an alcohol and water solution, although in some instances a salt or glycerine brine was used.

Operating pressures during normal pull down and operation for these early systems are about as shown by Figure 1. When the machine is started, the compressor draws evaporated refrigerant from the evaporator until such a small quantity of liquid is left in the evaporator that the suction pressure has been reduced to S1, at which time the expansion valve first opens and feeds refrigerant into the evaporator. When the compressor stops the suction pressure rises. At first the rise is rapid until the pressure is such as to close the expansion valve. Generally an increase in pressure of $\frac{1}{2}$ to 1 PSI is sufficient to do this.

Temperature Equalizes

The pressure continues to rise rapidly, however, until the temperature of the liquid in the coil equals with the brine surrounding it. Then brine temperature and the refrigerant temperature rise slowly to raise the suction pressure to S2 just before starting. One decided advantage the automatic expansion valve system has over other systems is that the compressor load is practically constant during the entire operating part of the cycle.

When the compressor first starts, it has a high suction pressure but a low discharge pressure. After the suction pressure has reached the pressure at which the valve opens, the discharge pressure is about constant at P2, which generally corresponds to 20 higher than the surrounding air, depending upon the effectiveness of the condenser used. At P1 the pres-

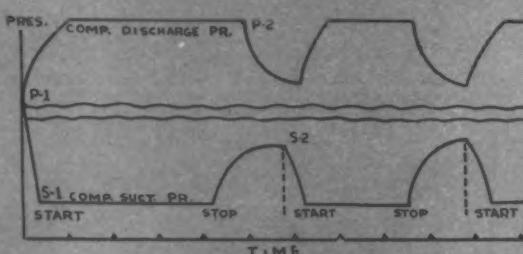


Fig. 1—Typical operating pressures during pull-down and operation of early household unit using automatic expansion valve.

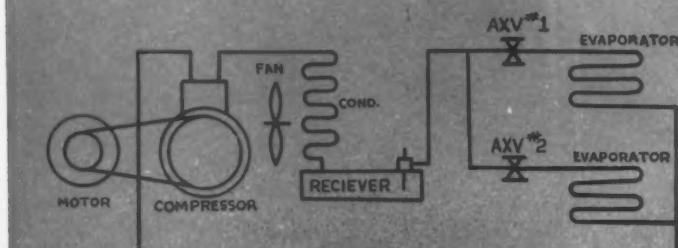


Fig. 2—System using two evaporators with two expansion valves tied in parallel to a single condensing unit.

EXPANSION VALVES

Presenting some basic facts to help you in your installation and servicing work with these metering devices

sure should correspond to about room temperature.

During the normal operating period, refrigeration takes place in only part of the evaporator coil in the brine tank. Suppose a condensing unit has a capacity of 1000 B.T.U./hr., the evaporator contains 25 feet of tubing, which has the ability to pick up 5 B.T.U./hr. per foot of tube which contains evaporating refrigerant. Suppose, also, that we are considering a pull-down condition in which the brine starts at 50° F. and the expansion valve is set to maintain 0° evaporating refrigerant in the evaporator. The length of tube in use

1000

is $\frac{1000}{5 \times 50} = 4$ feet. As the brine

5 x (50-0)

temperature is reduced to 40°, the tube in use equals $\frac{1000}{5 \times (40-0)} = 5$ feet.

And we can continue down, as shown in the table on this page.

Reference to the above table shows that when the brine temperature is reduced to 8° F., the whole 25 feet of coil is in use. At 7° the refrigerant requires more than the 25 feet in the evaporator to pick up sufficient heat

TABLE I

Brine Temp.	Ref. Temp.	Feet of Tube in Use
50	0	50
		$\frac{1000}{5 \times 50} = 4$
		5 x 50
40	0	40
		$\frac{1000}{5 \times 40} = 5$
		5 x 40
30	0	30
		$\frac{1000}{5 \times 30} = 6\frac{2}{3}$
		5 x 30
25	0	25
		$\frac{1000}{5 \times 25} = 8$
		5 x 25
20	0	20
		$\frac{1000}{5 \times 20} = 10$
		5 x 20
15	0	15
		$\frac{1000}{5 \times 15} = 13\frac{1}{3}$
		5 x 15
10	0	10
		$\frac{1000}{5 \times 10} = 20$
		5 x 10
9	0	9
		$\frac{1000}{5 \times 9} = 22\frac{1}{5}$
		5 x 9
8	0	8
		$\frac{1000}{5 \times 8} = 25$
		5 x 8
7	0	7
		$\frac{1000}{5 \times 7} = 28.5$

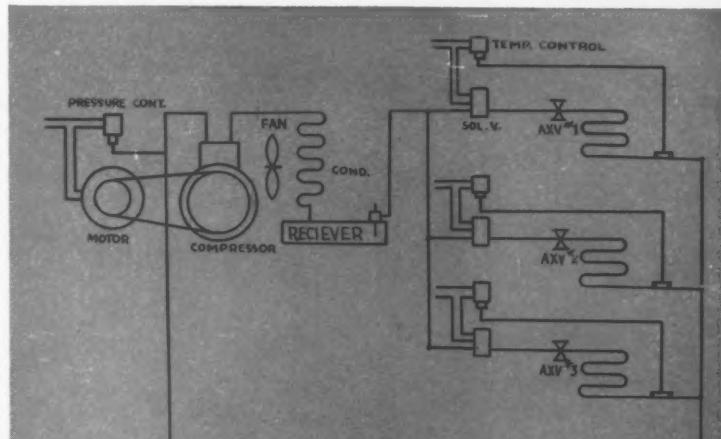


Fig. 3—Multiple system using three automatic expansion valves supplemented by temperature controls and solenoid valves on each evaporator.

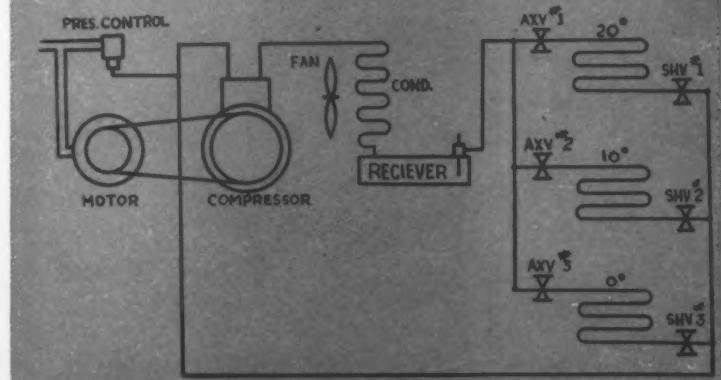


Fig. 4—Superheat control valve system layout, designed to make possible multiple expansion valve operation. This system uses three evaporators.

for complete evaporation, so that frost-back has occurred. If the temperature control is properly set for this expansion valve setting, it should stop the machine when the 8° temperature is reached.

An automatic expansion valve is inherently a device to be used with simple evaporator systems only. Figure 2 shows two evaporators with automatic expansion valves tied in parallel to one condensing unit. To start with, we will assume that both valves are set to control at exactly the same evaporator pressure. We will also assume that other required conditions are such that each evaporator receives refrigerant at the same rate. Suppose then that evaporator No. 1 requires more refrigeration. In this case, the evaporator tube in No. 1 evaporator would be only partly used, while that in evaporator No. 2 would be all in use and a frost-back would occur. If the temperature control was guided by the evaporator requiring the greatest amount of refrigeration, the other evaporator would frost-back consistently, or if the control was guided by the evaporator requiring the least refrigeration, the other evaporator would never become completely refrigerated.

Multiple Hook-Ups

If the expansion valve on evaporator No. 1 was set to maintain a 10 lb. back pressure and the one on evaporator No. 2 to maintain a 9½ lb. back pressure, evaporator No. 1 would get all the refrigeration while the valve on No. 2 might never open.

A pressure control for a normal expansion valve job, of course, is not practical, as there is no reduction in back pressure as the evaporator temperature decreases, which can be used to stop the machine.

Whereas automatic expansion valve systems are inherently single evaporator systems, they can, with auxiliary equipment, be used in multiple or in multiple temperature systems.

Figure 3 shows a multiple system using three automatic expansion valves supplemented by temperature controls and solenoid valves on each evaporator. As each evaporator is satisfied, its temperature control closes its solenoid valve and the pressure in the evaporators is reduced until the expansion valve set at a lower level opens. For instance, suppose that evaporator No. 1 had its valve set to maintain a 15 lb. back

To Make 'Em Pay . . . Make 'Em Smile

THE business of collecting past-due accounts, at best a fatiguing proposition, becomes both more pleasant and more productive when humor is used as the "pay-me" leverage, in the experience of St. Louis Refrigeration Service, St. Louis, Mo.

Like other firms, this company has found a varying percentage of its commercial refrigeration accounts delinquent from month to month at times to the point that something more than a cut-and-dried statement is required to bring about the desired "reaction." In such instances, the company credit office, instead of issuing a warning notice, or threatening collection-agency action, has resorted to a clever collection letter idea which invariably gets results.

This is a "poem" written by the credit manager, and sent to the delinquent account in a personal-correspondence envelope, on handsome personal notepaper. Written in ink, and with nothing businesslike about its appearance, the collection letter always gets to the person addressed ahead of other mail.

Entitled "A Poem You Oughta Read", the letter reads as follows:

Dear Mr. Blank:

How Do You Do?

Some Pay Bills When Due

Some Pay When Overdue

Some Never Due

How Do You Due?

"Our credit department is awaiting your check."

Signed

The letter is always read through before the recipient realizes that it is a bid for his attention to his overdue account. Because the letter is always written in longhand (usually by a secretary or office employee with a good hand) there is also little possibility that it will find its way to the wastebasket before the message has thoroughly registered.

Natural reaction of the reader is to smile at the "poem" and reach for his checkbook, the service firm has found.

Of 200 such letters sent at a quarterly "cleanup" period on overdue accounts, replies totaled 56 checks, and more than 100 promises of quick action. Humorous collection letters out-pull ordinary "please pay" pieces three-to-one.

pressure, No. 2 is set for 10 lb. back pressure, and No. 3 is set for 5 lb. back pressure. The pressure control may be set to cut in at 10 lbs. and out at 10-in. vacuum.

When the system starts up, the full capacity of the machine is used on No. 1 evaporator, as the other two valves will not open until their respective settings are reached. As No. 1 is satisfied, its solenoid valve closes and the back pressure is reduced from 15 lbs. to 10 lbs. when No. 2 valve operates. As No. 2 is satisfied, its solenoid valve closes and the full capacity of the machine is used on No. 2 evaporator. As its temperature control is satisfied, its solenoid valve is closed and the back pressure is reduced to 5 lbs. when No. 3 evaporator is cooled.

If No. 1 or No. 2 calls for cooling before No. 3 is satisfied, the solenoid valve for these evaporators may open,

which will temporarily rob No. 3 of refrigeration, as the back pressure rises to that of the expansion valve in operation at the highest back pressure setting. After all three evaporators are satisfied, and all solenoid valves are closed, the back pressure at the compressor will go down to the 10-in. vacuum required to stop the machine.

The system using solenoid valves can be varied by installing the solenoid valve in the suction outlets of the evaporators instead of ahead of the automatic expansion valve. Each type of hook-up has its advantages and disadvantages.

Other auxiliary valves have been tried to make the use of automatic expansion valves useable in multiple systems. In 1928, the writer set up a system of 10 refrigerators, all operating from a single unit, with auto-

Continued on page 77

"Liquid" REFRIGERATION SYSTEMS

Part 5 of a series on soda fountains prepared especially for readers of The Refrigeration Industry

By J. G. Praetz

General Service Manager, Liquid Carbonic Corp.

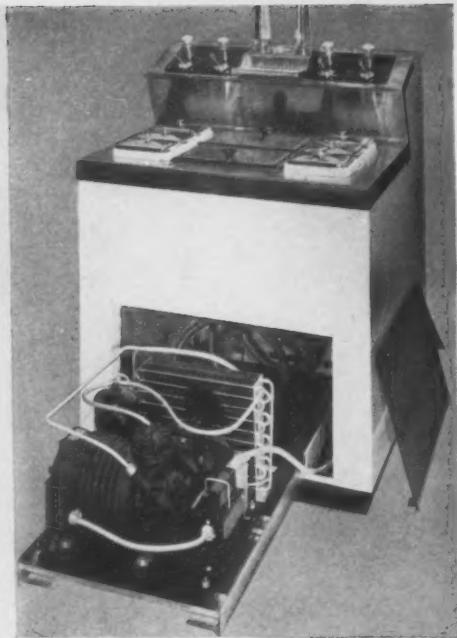


Fig. 17: The "Liquid" 2'6" Bobtail unit, showing condensing unit in pull-out position for servicing.

"Liquid" 2'6" Self-Contained "Bobtail" Units

THE 2'6" self-contained "Bobtail" Models 4124 and 4141 provide a water cooling compartment and a dry storage section refrigerated by a 1/4 H.P. single cylinder "Coperamic" condensing unit.

Water Cooling Compartment. The water cooling system on this Bobtail

is the holdover type, having a refrigerated water bath. The plain and soda water are cooled in a regular cooling coil, the water bath being refrigerated by a direct expansion evaporator.

The syrup jars set down in the ice water surrounding the cooling coils in the water bath. This refrigerates the syrups and keeps them at ideal serving temperatures.

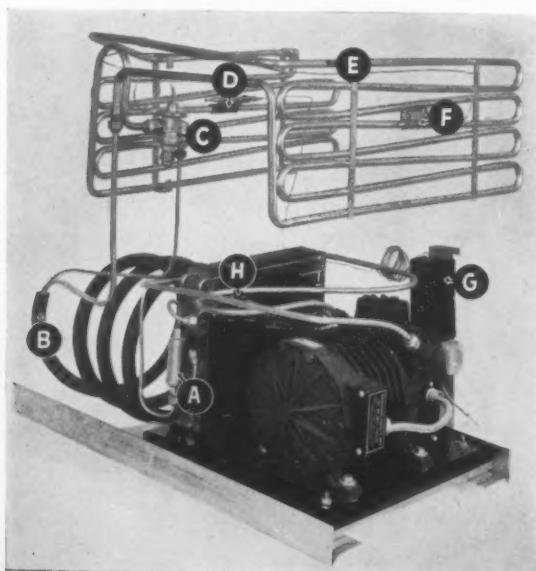
Dry Storage Compartment. The dry storage compartment is refrigerated by a wall evaporator. There are two sleeve openings in the dry storage compartment besides the drain. The refrigeration lines pass through the left sleeve while the right sleeve is for the soda and water connections. A can of cork permagum is supplied with each Bobtail to seal the sleeve openings at the time of installation.

The refrigerant passes from the receiver on the condensing unit thru a dehydrator thru a TEVF207 Automatic Products thermostatic expansion valve to the water cooling compartment evaporator. The thermostatic expansion valve installed inside the dry storage compartment is factory set for 10° superheat and should not require readjustment.

Fig. 18: Schematic hook-up of the 2'6" Bobtail. (A) Dehydrator; (B) pull-out coil; (C) expansion valve; (D) temperature control bulb; (E) dry storage evaporator (on front wall); (F) expansion valve bulb; (G) temperature control; (H) receiver purging plug.

Control. The condensing unit control on this Bobtail is by means of a White-Rodgers No. 1609 (or No. 1634) temperature switch (8' capillary), the bulb being clamped to the water cooling evaporator in the water bath. The approximate settings on the switch will be 24° cut-out and 30° cut-in. The settings required will vary depending on water load conditions.

Electric Current. These units are for use only where 110 volts, 60 cycle, single phase AC current is available.



Electrical connections in accordance with the local code must be made in the field to the combination toggle switch-junction box which is provided on the bobtail. The toggle switch permits manual control of the condensing unit for servicing.

Condensing Unit. The condensing unit used on these bobtails is a special 1/4 H. P. Copelametic semi-sealed unit assembled by "Liquid." It consists of a Model 42-251 single cylinder Copelametic compressor with a special high capacity condenser and receiver.

Receiver Capacity

The receiver has a capacity of 4 lbs. of F-12 refrigerant and is equipped with a liquid shut-off valve to permit pumping down the evaporator should it become necessary to replace the expansion valve. A permanent silica gel dehydrator is installed at the outlet of the receiver in the liquid line.

The Copelametic compressor is mounted on four coil springs under compression to absorb vibration. The condensing unit is equipped with slides and a pull-out coil so that the complete assembly may be pulled out for easy servicing.

The liquid line from the machine to the expansion valve is 1/4" while the suction line is 3/8". The liquid and suction lines are coiled and spot soldered together to act both as a heat exchanger and pull-out coil. Sponge rubber is used to cover the pull-out coil.

Fan Hook-Up

The condenser fan motor is connected in electrically so that if the compressor is cut out due to the overload relay, the condenser fan will continue to run. In this way the cooling air circulating over the compressor will cool it down to normal operating temperatures in a shorter time, with the result that the overload will cut back in again and start up the unit.

Refrigerant Charge. The refrigerant charge for these Bobtails is 3-1/4 lbs. of F-12. The condensing units are designed for use only with F-12, and are factory charged with refrigerant. Never use any anti-freeze or other trade-name products for moisture in Copelametic units. To do so voids the guarantee.

Installation. To install the Bobtail after uncrating, connect an electrical

supply (110 volt, 60 cycle, single phase, AC current) to the combination toggle-switch-junction box located under the temperature control on the side of the machine compartment.

Connect a drain line to the 1" pipe waste outlet from the dry storage compartment. A cold water supply must be run to the side of the machine to connect the water supply to the water compartment. A short length of 3/8" copper tubing should be used to cooling coil.

Run a 3/8" copper water line through the sleeve and connect directly to the 1/2" x 3/8" pipe brass reducing bushing on the cooling coil inlet. A flaring type fitting is supplied at the soda water inlet connection on the cooling coil to facilitate installing the carbonated water leader.

Install the cold water and the soda water draft arms. For most efficient dispenser operation from the unit, the soda draft arm should always be on the side of the draft station toward the ice cream cabinet if one is being used with the Bobtail. The soda draft arm has a spray head inside the black bakelite nozzle. The cooling coil con-

nexion to the soda draft arm is equipped with a small shut-off valve to facilitate changing soda washers or tumblers.

To remove the soda and water cooling coil from the cooling compartment for servicing, take out the pumps and jars and remove the draft station by taking out two front and two rear holding screws. The coil can then be readily removed.

Start Up and Initial Pull-Down on Installation. This unit will require approximately 4 hours for the initial pull-down.

To start up:

- (1) Open the compressor discharge service valve wide.
- (2) Open the compressor suction service valve wide.
- (3) Open wide the liquid line shut-off valve on the receiver.
- (4) Check for leaks.
- (5) Start the condensing unit by moving the switch to "on."
- (6) Check the setting on the temperature control.
- (7) After about 10 minutes operation, fill the water cooling section full with cold water.

Continued on page 61

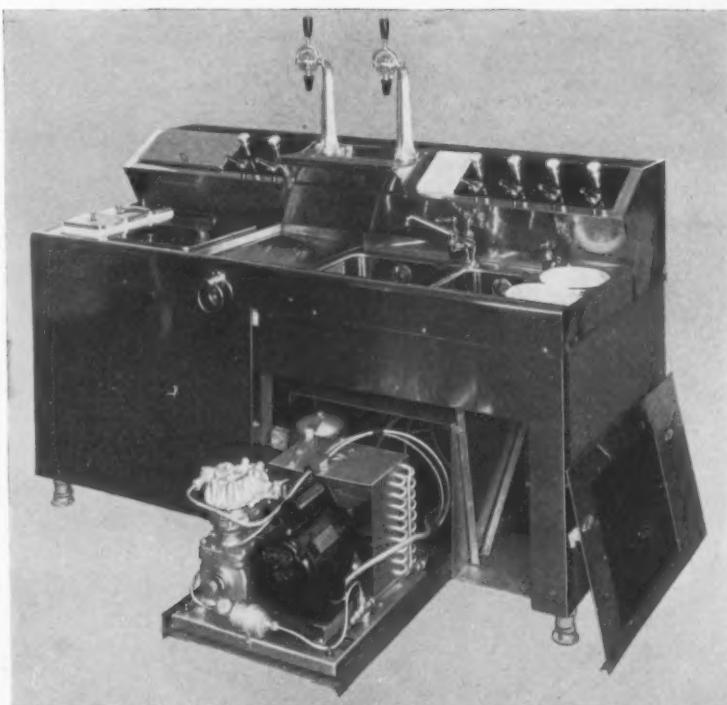


Fig. 19: The 5'6" Bobtail with self-contained condensing unit. This model was equipped with a 1/3 H.P. Brunner machine, has a combination dehydrator-liquid indicator installed on the outlet side of the receiver in the liquid line.



HOW IT WORKS



In this cutaway view, the handle has been pulled to open the door. This lowers the trigger (a), made in one piece with the lock (b). A metal plate (c) rests in a notch of the spring-actuated bolt (d) and keeps the trigger cocked.

HOW IT HOLDS

To trip the trigger, close the door. The bolt yields just enough to swing the plate past center. Now it exerts its power horizontally on the catch—a bulldog grip that never eases up.



GRAND Rapids Brass Company presents the strongest, most positive automatic trip lock ever devised. Exclusive patented design permits fingertip operation. But once it's closed, there's constant pressure that assures an air-tight, heat-tight seal even against a worn gasket.

Materials and appearance meet the high standards you expect from this company. The

lever is forged brass on a stainless steel pin. The bolt is extruded brass, the casing of special zinc alloy diecast under hydraulic pressure. Finished in mirror-like chrome.

This lock is available for all commercial refrigeration applications in 3 sizes, with adjustable strikes that provide a wide range of offsets. Write for descriptive circular giving specifications and prices.

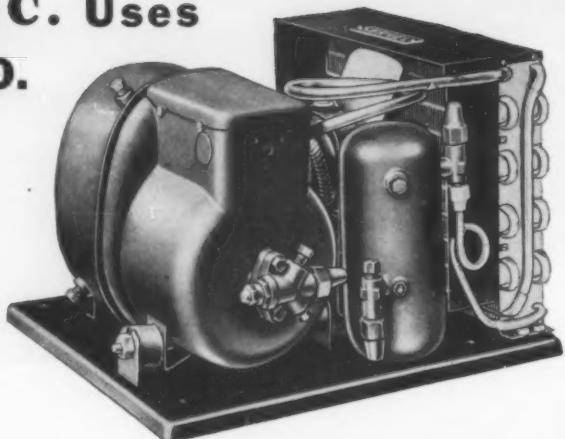
*Manufacturing a full line
of hardware for
commercial refrigeration*

Grand Rapids Brass Company

Makers of Dependable Refrigerator Hardware for over 40 Years

Grand Rapids 1, Michigan

SERVEL INC. Uses MUELLER BRASS CO. PARTS IN THEIR SUPERMETIC CONDENSING UNITS



A MODERN PRODUCT STANDING ON A FOUNDATION OF 25 YEARS OF FIELD EXPERIENCE

The factory-sealed steel case Servel Supermetic will be offered in ten or more models covering all popular applications in the fractional horsepower field. These comprise reciprocating-type compressors directly connected to the most modern type of electric motors. The power units (motor-compressor assemblies) are encased in a welded steel shell for permanent protection. The power unit is mounted with the condenser, receiver, fan motor, and accessories on a rigid steel base completely connected and ready to install. Construction complies

fully with requirements of Bureau of Standards, Underwriters, and all other nationally recognized codes. These units are applicable to 50- and 60-cycle current (with reduced capacity at the lower frequency) and the range of models include low-, medium- and high-temperature types in all popular sizes. Designed for use with Freon-12 refrigerant only.

SERVEL INC. Evansville, Indiana

These Products

MUST BE GOOD!

BUILT-IN QUALITY TIME-TESTED PERFORMANCE

Mueller Brass Co. Valves, Fittings and accessories are sturdily and dependably built. They have a well-earned reputation for built-in quality and time-tested performance.

The Mueller Brass Co. line of refrigeration products is exceptionally complete, and all products are designed and manufactured specifically for mechanical refrigeration work. THEY ARE USED BY ALL OF THE LARGEST MANUFACTURERS THROUGHOUT THE UNITED STATES.

OBVIOUS CONCLUSION: Mueller Brass Co. products must be good!



MUELLER BRASS CO.
PORT HURON, MICHIGAN



About People

Two new regional managers have been appointed by Electric Power Equipment Corp., manufacturer of "Green Dragon" commercial refrigeration equipment. **S. C. Moncher** has been assigned the New York and New Jersey territory, while **M. J. Meiklejohn** will cover the New Eng-



Mr. Moncher



Mr. Meiklejohn

land area. Mr. Moncher, the author of several books and a great many articles on refrigeration and air conditioning, spent much of 1945 in Elpeco's engineering and development departments. Mr. Meiklejohn, who recently resigned as production manager of Spencer Thermostat Co., served during the war as works manager of the Philadelphia Mobile Shop Depot of the Army Ordnance Department.

Edward B. Maire has been named manager of the Chicago factory branch of General Controls Co. Mr. Maire, who has had eight years of experience in the automatic control business, will serve users of the company's controls in Illinois, Indiana, Wisconsin, Iowa, Minnesota, and North and South Dakota.

P. A. Alers has been appointed manager of the El Paso, Tex. office of Worthington Pump & Machinery Corp. Mr. Alers has been connected with Worthington since 1933.

W. S. (Bing) Law has been appointed manager of refrigeration sales for Norge Division of Borg-Warner Corp. to fill the vacancy created when E. R. Bridge was promoted to the position of merchandise manager. Mr. Law has just returned

to civilian life after nearly three and one-half years in the Army Air Forces. He has spent 14 years with the Norge organization as an employee of Reinhardt Bros. Co., Minneapolis distributor, and at the time of his entry into the armed services was sales manager of that company's Norge appliance division.

Cal Pierce has been appointed district sales manager for the Par Division of Lynch Mfg. Corp. in the area including Kentucky, Virginia, North and South Carolina, eastern Tennessee, Alabama, Georgia, and Florida. Mr. Pierce was dis-

charged from the armed forces last fall after more than three years of service. Prior to the war he covered several eastern states as a manufacturers' agent for Par and many other lines.

Richard E. Smith has been appointed production manager of Quillen Brothers Refrigerator Co., Indianapolis, and **William H. Durham** has been named regional sales director for the south central territory. Mr. Smith formerly was superintendent of the machine division of Curtiss-Wright Corp., and Mr. Durham, who has been in the army since

1942, has been in the automotive field. His headquarters will be in Dallas.

Robert C. Padgett, Jr. has been named local manager of appliance sales for the General Electric Co. in Seattle, Wash. He has just completed three years with the armed services.

Four new branch sales office managers have been named by Penn Electric Switch Co., three of them to head up newly established offices on the West Coast. **William H. Krack**, recently returned from overseas serv-



Mr. Layport



Mr. Krack

ice as a Captain in the Field Artillery, will be Penn's representative in Los Angeles. Before joining the Army he was a sales engineer in the New York office of Detroit Lubricator Co. **Edward T. Layport** will manage the Berkeley, Calif. office. One time sales engineer for Frigidaire and Kelvinator, Mr. Layport served as industrial engineer for Continental Can Co. before joining Penn. The Seattle office will be run by **Meroy A. Anderson**, recently re-



Mr. Anderson



Mr. Gray

turned from service with the Navy as a Lt. Commander dealing with special electrical and electronic equipment. Prior to the war Mr. Anderson spent seven years in Penn's engineering department. **Harold D. Gray** has been appointed manager

Continued on page 72

TH



They don't always line up like this in the Zero Pac store—but they do when there's butter for sale. Large crowds like this, the store finds, mean small unit sales, but "specials" like butter are worth while, promotion-wise.

HERE'S more to a good many things in the refrigeration field than meets the eye—and a good example of that is the Zero Pac frozen foods store at 16008 Detroit Ave., Lakewood, Ohio. For in addition to

operating on its own as a frozen foods sales outlet, with perhaps as wide a variety of these products as any location in the greater Cleveland area, it is designed to serve as a practical "proving ground" for store

equipment and merchandising ideas, and as an interest-builder in home freezer sales as well.

The store, set up as a separate operation by Allied Refrigeration Engineering Co., Cleveland commercial refrigeration distributor, under the personal supervision of E. W. Farr, Jr., has been in operation only a little over four months, so there are still a number of test points that remain to be demonstrated insofar as equipment uses, locations and similar things are concerned. But one cardinal point seems well on the way to being established—a store selling frozen foods exclusively can make its own way, if it's backed by smart promotion and staffed by a sales-minded crew.

Here are a few facts covering the store's operation:

Some 160 varieties of frozen foods are stocked, ranging all the way from the common types of vegetables and fruits to such out-of-the ordinary frozen fare as lobster tails, frog legs, half-turkeys, ready-to-bake pastries and pies, frozen pie crust, frozen orange juice, lemon juice, tangerine and grapefruit segments, frozen fresh



Frozen green shrimp is one of the favorites of the 160-odd kinds of foods the store merchandises. Here manager Donald Leavens packages some for a customer.

E BEST TEACHER

coconut, "green" (uncooked) shrimp, to name only a few. Donald Leavens, who manages the store, with Avery Farr and Arthur Farr, both World War II veterans, as assistants, says that unusual foods like those named above catch on quickly, although the backbone of sales continues to be the more familiar—and accepted—vegetables and fruits.

"Quickie" Items Popular

However, the unusual foods continue to attract their share of customers, who have come to depend on the store for the newest in these products. Families where both husband and wife work, especially, seem to be attracted to foods with which they can assemble a meal in a hurry, have it ready for serving in jiffy-time. Such products as ready-to-bake cinnamon rolls, clover-leaf rolls and blueberry muffins have found ready acceptance. So, also, has a recently-introduced feature—frozen cube steaks. The store buys these steaks unfrozen, packages them in "units" of three or four, and freezes them itself.

Another item the store plans to merchandise, as soon as they are available, is pre-cooked frozen meals, such as are now being served on some transatlantic airliners and were served on some military planes during wartime. Products like these are the magnets which the store will use to draw customers, who in this way, it is hoped, will develop into important customers of frozen foods, leading directly into the other two phases of the field in which the sponsoring firm is interested—complete frozen-food-store equipment and home freezer cabinets.

The home freezer proposition, understandably, is primarily promotional, and the store has recently inaugurated a neighborhood advertising program offering a 6-cu. ft. cabinet as part of campaign for new customers. Cooperating in this phase of the campaign are both Allied Refrigeration and Avery Engineering, another Cleveland refrigeration firm,

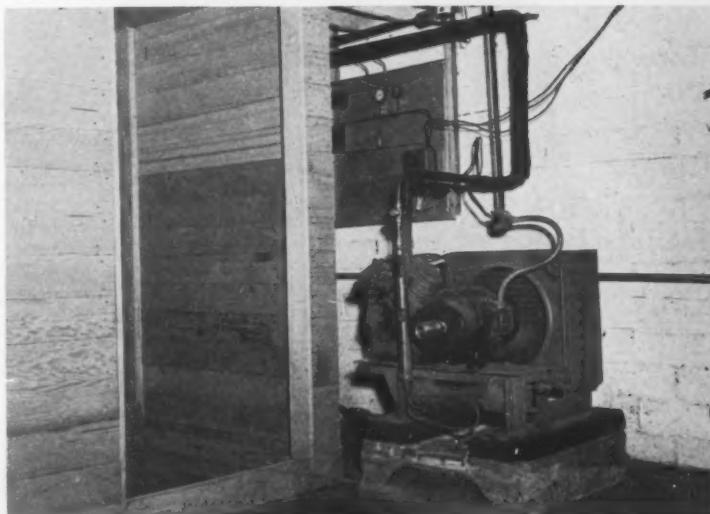
together with three associated concerns in the foods field: Fairmont Frosted Foods, Booth Frosted Foods, and Baum Ice Cream Co., Cleveland. In addition to a wider interest in frozen foods, a number of prospects for home freezer cabinets are expected to develop from this promotion. These leads will be turned over

to the cooperating firms for follow-up. In addition, the advertising is expected to provide a gauge as to the desirability of inaugurating a regular home-delivery service for large-scale frozen food customers.

All this information, of course, will help the Zero Pac store to do a better merchandising job on frozen foods;



Here's a portion of the 2000-cubic-foot capacity storage space in the Zero Pac store. This cooler has replaced the original 8x13-foot unit, which proved inadequate.



This 3 H.P. Carrier machine serves the storage cooler. Anteroom at left may eventually be equipped for above-zero storage of some items.

but, just as important from the refrigeration man's standpoint, it will furnish valuable background information on check-points to be observed in setting up a commercial frozen foods outlet—and it is from this field that Allied expects to develop an important share of its future sales volume.

As an indication of the interest which a merchandising operation of this nature generates, E. W. Farr, Jr. reports that in the short time since the store was opened Allied's commercial frozen food cabinet sales have increased by more than 20 per cent. Scores of inquiries have been received from retailers in Ohio and neighboring states, who are interested in the profit possibilities of frozen foods. Some of them are interested in outlets selling frozen foods exclusively; others want to add frozen foods departments in their present stores.

As mentioned previously, the store has been in operation only a little over four months, so the self-education job has really just been started. Even in this short period, however, certain rather significant sign-posts have been established regarding the set-up and equipping of neighborhood frozen food stores. Here are some of them:

1. *Allow plenty of space for sales and display.*

At the outset, the Zero Pac store was 20 by 20 feet; today it's 20 by 40 feet. The original space, 20 feet deep, simply wasn't sufficient to take



Condensing unit line-up for the 80 feet of frozen food cabinets in the store. Unit at far left serves a self-serve dairy case; the other three, of 1 H.P. capacity each, handle the low-temperature cabinets.

care of the customers comfortably. Originally, for storage purposes, the store had a low-temperature walk-in unit 8x13 feet installed at the rear of the sales floor, and there were 8 frozen food display cabinets of 8-foot length in the store itself. Now there are ten 8-foot cabinets (four on each side, two in the front of the store) and the storage cooler is downstairs. The storage cooler, from its original 8x13 feet size, has been increased to 13x27 feet, outside dimensions, and it provides 2000 cu. ft. of space. The storage unit is equipped with a Carrier cold diffuser, with water defrosting feature, and is served by a 3 H.P. Carrier condensing unit. Temperature in the storage room is held at about -5°F.

2. *Make the store as nearly self-service in operation as possible.*

Customers buy more when they are allowed to "browse around" and do their own selecting, the store has discovered. Frozen foods, despite their long years on the market, are still a comparatively new thing to most buyers. They know about the old reliables, like peas, string beans, lima beans, and the more common fruits, but the newer items—ready-to-bake rolls, pies, orange and lemon juices, fresh coconut, for example—are things they like to "discover" for themselves, for the most part. Let them browse, and they'll buy. Very seldom, the store finds, does a customer come in and pick out just one item. Left to pick and choose for themselves, they'll generally come up

with at least two or three items. This has two desirable features: it ups the unit sales figure, and it increases the customer's appreciation of the many varieties of frozen foods available today. Both of these are important factors in sustaining interest in the frozen foods field.

3. *Self-service or not, keep an attendant free to do the necessary "educational" work.*

Customers like to feel free to choose their own foods, but they also appreciate and respond to the advice of a person they feel is qualified to keep them informed on the newer, easy-to-prepare foods and on such "specials" as are being offered at the moment. This attendant, who acts in the capacity of a frozen food counselor, can do much to create interest in home freezer cabinets by showing the buyer new ways in which to make low-temperature equipment like this a part of the every-day routine in the home. One way Zero Pac attendants have of doing this is to point out to customers how bread, cakes, etc. stay fresher longer if kept under refrigeration. Persons who now have home freezers know these things, for the most part, and if they happen to be in the store when the salesman is spreading the word, they add their opinions to his. It all makes for more sales, both in foods and in cabinets.

4. *Make frozen food customers home-freezer conscious; this will make them volume buyers of frozen foods.*

Continued on page 67

ZERO PAC
CORPORATION
Lakewood's Only
Complete
**FROZEN FOOD
STORE**
16003 DETROIT AVE.
HOME DELIVERY BO. 5253
We Handle a Complete Line of
Fresh Frozen Vegetables, Fruits,
Fish, Meat, Ice Cream, Poultry
and Dairy Products

The coupon below entitles you to a 10% discount on all
family & 6 Cu. Ft. HOME FREEZER of this design installed and
warranted for one year. Bring the coupon to our store.

Name.....
Address.....
Phone.....

Are you interested in home delivery?.....
Do you have a HOME FREEZER?.....

This Advertisement is Sponsored by
BAUM'S ICE CREAM — FAIRMONT FROSTED FOODS
BOOTH FROSTED FOODS
ALLIED REFRIGERATION—AVERY ENGINEERING CO.

One of the store's campaigns to invite both food and home freezer prospects. Note the ice cream-frosted foods-refrigeration dealer tie-in of sponsors for this promotion job.

REFRIGERATION INDUSTRY

News

SEEING IS BELIEVING



Supervising the unloading of the first carload of 1946 Crosley "Shelvador" refrigerators to reach Jackson, Miss. are (left to right) B. H. Brown of Southern Wholesalers, Inc., Crosley distributor; George C. Tanty, Crosley regional manager; S. D. Camper, president of Southern Wholesalers, Inc.; Leroy Rouell, Crosley dealer; and Don Camper also of the distributorship.

VA STARTS CHECK ON VET TRAINING

A system of monthly checks by training officers of the Veterans Administration on each veteran's progress in both on-the-job training and schools has been instituted in an attempt to "crack down" on inadequate courses of instruction and unethical or illegitimate training programs.

Subsistence payments have been ordered withheld from veterans failing to show satisfactory progress in legitimate training courses.

Under the new directive, the VA will require each job-training establishment to furnish a written report of its training course. It is further stipulated that each such course must lead to a definite position within a reasonable time.

The directive was issued as a further move to protect the veterans from the activities of unscrupulous "fly-by-night" individuals or organizations interested only in obtaining the ex-GI's money without offering anything in return.

M-H REGULATOR CO. HAS BIGGEST YEAR

Exceeding its best peacetime year in the production of its regular line of equipment, Minneapolis-Honeywell Regulator Co. has reported net earnings of \$3,436,637 for the year ending Dec. 31, 1945, after deduction of \$8,347,000 in taxes. Net earnings for 1944 were \$3,239,676.

Net sales during 1945 totaled \$84,392,427, compared with \$89,306,433 in the previous year.

MASTER-BILT BUYS NEW BUILDING

A three-story building formerly occupied by a unit of the Emerson Electric Mfg. Co. in St. Louis has been purchased by Clarence J. Hunter, Robert P. Sludger, and Harold J. Klawitter, operators of Master-Bilt Refrigeration Mfg. Co.

Builder of commercial refrigeration units ranging in size from milk coolers to walk-in boxes, the firm plans to expand its operations into the farm freezer field. The newly acquired building will provide 55,000 sq. ft. of floor space.

FROZEN FOOD FOUNDATION CHARTS SALES PROGRAM FOR DEPARTMENT STORES

An ambitious, well-integrated program for the merchandising of frozen foods through department stores in every part of the country recently was outlined by Frozen Food Foundation and its affiliated organization, Frozen Food Products, Inc., at a three-day familiarization meeting and product presentation at the organization's headquarters in Syracuse, N. Y.

Representatives of department store members of the Foundation from coast to coast, frozen food processing firms, and manufacturers of refrigeration equipment attended the sessions which concluded with a comparative "taste panel" demonstration and a luncheon at which all food from the bread to the coffee had been frozen for considerable periods of time.

The program provides for

NEW JAHCO FIRM TO MAKE COMPRESSORS

Plans for the production of refrigeration compressors claimed to weigh "less than one-third of any other developed" have been laid by Jack & Heintz Precision Industries, Inc., the new corporation which resulted from the recent merger of Cleveland's fabulous Jack & Heintz organization with outside interests.

Fractional horsepower electric motors are also high on the list of the new firm's "products to come."

The new refrigeration compressors, it is said, will be adapted for air conditioning systems.

Among the group of individual investors who has acquired an interest in the new concern is Edward R. Legg, former assistant general sales manager of Kelvinator Division, Nash-Kelvinator Corp. and one-time head of Kelvinator's ice cream cabinet sales division.

frozen food merchandising both over the counters of department stores and also through a home delivery service involving the use of a "pilot plant" operation. Low temperature refrigeration equipment used in this closely knit merchandising chain includes bulk storage facilities of various types, store-type sales and display cases, order filling cases used in the pilot plants, refrigerated trucks for home delivery, and the home freezers themselves.

PERFEX CORP. FORMS CANADIAN COMPANY

Formation of a Canadian subsidiary to be known as Perfex Controls, Ltd., with headquarters in Toronto, has been announced by Perfex Corp., Milwaukee manu-



Mr. Spall

facturer of automatic temperature controls.

Officers of the newly formed subsidiary are: J. K. Luthe, president; C. E. Lewis, vice president; E. G. Spall, vice president; V. R. Tate, secretary; A. L. Eastcott, treasurer; J. F. Van Lane, assistant treasurer.

Mr. Spall will serve as active head of the Canadian operation. He will be assisted by Murray K. Bowman, who will handle sales and field service.

WESTINGHOUSE AIR CONDITIONING DIV. MOVES TO BOSTON

Manufacturing and engineering facilities of the B. F. Sturtevant Co., purchased by Westinghouse Electric Corp. last year, are being integrated with the facilities of the Westinghouse air conditioning division, which has been transferred from Jersey City, N. J. to the Sturtevant plant at Hyde Park, Boston.

Ellis L. Spray, Westinghouse vice president in charge of the company's elevator and air conditioning divisions, has been named executive vice president of the new organization, which is to be known as the B. F. Sturtevant Co. Division of Westinghouse.

G. C. Derry, formerly vice president of the Sturtevant company, has been elected vice president and general manager of the new division, and is responsible for over-all operation of the business. E. B. Williams, also a former Sturtevant vice president, continues in that office.

Other manufacturing and assembly activities will be continued at former Sturtevant plants at Camden, N. J., La Salle, Ill., Berkeley, Calif., and Galt, Ont. The 42 offices of the Sturtevant company will be coordinated with Westinghouse distribution facilities.

CARRIER TO COOL SOUTHERN LINERS

Three new 18,000-ton Delta Line passenger liners under construction at Pascagoula, Miss., will be air-conditioned by Carrier Corp.

Orders placed with Carrier call for equipment to cool all passenger staterooms, public salons, officer's deck, promenade deck, hospital space, mess rooms and crews quarters. The new vessels, slated for the New Orleans-Central America run, will operate almost entirely in tropic temperatures and the air-conditioning is intended as a bid for postwar travel business.

EMERSON ELECTRIC EXPANDS PLANT

Emerson Electric Mfg. Co. has announced its post-war expansion program which involves moving all manufacturing and office facilities from its downtown buildings to one of St. Louis' newest and most modern plants, following lease arrangements with the Reconstruction Finance Corporation.

This 5-million dollar plant was erected under Emerson Electric's supervision for the development and manufacture of airplane gun turrets during the war. Emerson had previously acquired the 162-

acre tract and completed its first plant there in 1940, for the manufacture of hermetic motors.

All of the company's operations will be consolidated at this location and the entire move is scheduled for completion in September.

Based on floor area, the move will mean an increase in work space of about 50%, but production increases will range up to 200% on some products and increase in employment is expected to average well over 25%, the company claims.

DEPT. STORE OPENS APPLIANCE ANNEX

The F. & R. Lazarus & Co., Columbus, Ohio, department store, has completed its new \$325,000 Lazarus Annex, a separate housewares and major appliance store diagonally across the street from its main store.

A remodeled version of what once was the Columbus Auditorium, the new annex boasts the city's largest stage, which now is used to set off five complete model kitchen displays.

Mrs. Frank Lausche, wife of the governor of Ohio, and Mrs. James Rhodes, wife of the mayor of Columbus, were scheduled to take part in the radio broadcast of the formal opening ceremonies.

ICEBERG ANNOUNCES 16 NEW DISTRIBUTORS

Iceberg Refrigerated Locker Systems has announced the following distributor appointments:

Reines-Freeman Distributors, Albany, N. Y.; The R. M. Flagg Co., Bangor, Me.; 20th Century Refrigeration Co., Cincinnati; W. B. Haines Food Machines, Dayton; Bandoli-McIntyre Co., Los Angeles.

Seneca Corp., Philadelphia; Motor Power Equipment Co., St. Paul; The Toledo Merchandise Co., Toledo; W. T. Shackelford Co., Atlanta; Alford's Supplies, Albuquerque, N. M.

Rhoads Refrigeration & Store Equipment, Ft. Wayne, Ind.; Arthur Boot Co., Grand Rapids, Mich.; James & Roach, Detroit; Johnson Furniture Co., Mitchell, S. D.; Cumberland Sales Co., Inc., Nashville; Refrigeration Suppliers, Inc., Norfolk, Va.

FRAME HEADS NEW BALTIMORE SCHOOL

Herbert Frame, formerly service manager for the Public Service Co. of Baltimore, has left that company to become president and principal of Refrigeration Institute, a new trade school in Baltimore.

At one time Mr. Frame was associated with the jobbing business of Parks & Hull Appliance Corp.

IN THE SPRING A BUSINESS MAN'S FANCY TURNS TO THOUGHTS OF . . . SALES MEETINGS



Factory men and field representatives of Kold-Hold Mfg. Co., Lansing, Mich. manufacturer of "hold-over" truck refrigeration systems and plate-type evaporators, swung into their Spring selling activities with a get-together at Lansing's Hotel Olds. Attending this meeting were: (standing, left to right) C. H. Reynolds, C. K. Davis, F. E. Heidrich, J. R. Tranter; (seated, left to right) R. D. Spitzer, H. C. Hoover, E. A. Thield, T. O. Lester, L. R. Burr, A. L. Golay, J. C. Jackson. Three Pacific Coast Kold-Hold representatives who attended the meeting are not in the picture. They are: L. F. Young, Leo J. Freitas, and H. S. Ryan.



This was the lineup at Ansul Chemical Co.'s first postwar meeting: (standing, from left) Henry Gullatt, Atlanta; Joe Moore, Kansas City; R. C. McNeely, advertising manager; Ralph Berry, Atlanta; Ray Polley, Fort Worth; L. C. McKesson, sales director; Franklin Wedge, eastern manager; Tom Plouff, assistant sales manager; Elmer Billings, home office; Kenneth Covert, Paoli office; Clyde Broughton, credit manager; Law Russell, Los Angeles; Herman Goldberg, Chicago; (seated, from left) R. C. Hood, secretary; Floyd Duval, Indianapolis; George Vermilye, sales manager; F. J. Hood, vice president; H. V. Higley, president.

CANADIAN SERVICEMEN MEET IN TORONTO; GORDON ROE IS NAMED NEW PRESIDENT

More than 400 members and guests of the Interprovincial Association of the Refrigeration Service Engineers Society took part in a two-day program of educational addresses, organizational activities, and entertainment features as Canadian servicemen and their suppliers swung into their first full post-war year at the Association's 7th annual conference March 17 and 18 at Toronto's King Edward hotel.

As always, the meeting was liberally leavened with informal and impromptu "shop talk" sessions in hotel rooms and corridors. One of the most frequently heard topics of conversation at these little gatherings was, as might be expected, the problem of supplies and deliveries—and how to get them.

Keynote of the conference's educational program was the stress laid upon the fact that sound and basic principles of business operation are as essential to the success of any service enterprise as is the technical "know how". It was pointed out that the spectre of rising new business failures threatens both the experienced service men and the returning war veterans who are anxious to get into business "on their own".

In the Association's annual elections, Gordon Roe of Montreal was named president for the coming year. Other officers elected included: Al Pike, St. John's, Newfoundland, 1st vice president, and C. O. Cunningham, London, Ont., 2nd vice president. G. Condle of Toronto continues as treasurer and E. G. McCracken of Toronto was re-elected secretary. A. E. Doan of Toronto was named chairman of the educational committee, and R. Paton of Vancouver is the new sergeant-at-arms.

The 14 directors named included two from each of six chapters represented and two members-at-large. They are: Mt. Royal chapter, J. D. Ross and A. Gendron; Nova Scotia, C. Treadwell and L. Mullinger; New Brunswick, A. LaFlamme and G. Larlee; Capitol City, W. Podd and H. Arthur; Calgary, H. R.

Dickieson and H. T. Dowling; Maple Leaf, J. Spence and A. Olmstead; Members-at-large, F. Chance of Winnipeg and W. Beebee of Ft. William.

At the association's luncheon on the second day of the conference G. E. Graff of Ranco, Inc. spoke on the need for industry-wide cooperation as an aid to better understanding between the industry's various elements and also as a means of leveling out the seasonal sales and production curve.

Among those whose talks dealt with non-technical phases of the service business were Paul B. Reed of Perfex Corp. who outlined the basic problems confronting any individual intending to go into business for himself, H. L. Kearns, a Toronto insurance man who discussed that topic as it affects the service business, and Mr. Graff.

Subjects of technical talks, and the speakers who presented them, follow: "High Performance Heat Transfer Surfaces,"

J. G. McMillen, KeepRite Refrigeration Ltd., Brantford, Ont.; "Cold Plates," Al Sawyer, Dole Refrigerating Co., Chicago; "Air Conditioning Operation and Service," W. B. Miller, General Electric Co.; "Evaporative Condensers," J. F. Watt, Cimco York, Toronto; "Advantages of Heat Interchangers," Paul Domke, Mueller Brass Co., Port Huron, Mich.

Harry S. Parish, editor of the "Canadian Refrigeration Journal," conducted his traditional "Information Please" forum, with questions being pitched by attending servicemen and caught by a "board of experts" composed of the speakers on each day's program.

CONN. COOLING IS NEW CARRIER DEALER

Connecticut Cooling Corp. New Haven, Conn., has been appointed exclusive dealer for Carrier Corp. in the New Haven area. The firm will handle both refrigeration and air conditioning.

ADMIRAL NETS PROFIT OF \$711,310 IN '45

Net earnings of \$711,310.15 for the year ending Dec. 31, 1945 have been announced by Admiral Corp. in the company's annual report. This is equal to 79 cents a share on the 900,000 outstanding shares of common stock and is slightly lower than the previous year's earnings of \$723,968.56.

The company's reconversion program, it is reported, including scrapping of all tools and dies acquired from Stewart-Warner Corp. for the manufacture of the "Dual-Temp" refrigerator and the installation of new equipment for the manufacture of the redesigned post-war models.

Because of the steel strike, the report continues, the manufacture of refrigerators is 50% behind anticipated volume. The company's postwar selling organization, the report shows, consists of more than 15,000 franchised dealers, of whom 12,000 will handle refrigerators and home freezers.

SERVICEMEN AND SUPPLIERS TALK IT OVER AT TORONTO



1—Ed Spall, Perfex Controls, Ltd.; Jack Ross, of Railway & Engineering Specialties, Ltd., Montreal wholesalers; James Spence, of Hamilton, Ont.; Paul B. Reed, Perfex Corp.; and Allan E. Watt, Penn Controls, Ltd., pause outside the meeting room to discuss the materials situation. 2—Harold Donnell, president of the Maple Leaf Chapter; Gordon Roe, newly elected president of the Interprovincial Association; W. H. Sneath, retiring president of the Association; and E. G. McCracken, Association secretary, listen attentively to the luncheon address by G. E. Graff of Ranco, Inc. 3—Paul Reed, Ed Graff, Paul Domke of Mueller Brass Co., and C. W. Stoner of Ben-Hur Mfg. Co. get set to answer questions from the floor as the second day's "Information Please" session begins. 4—W. J. Nye, Superior Refrigeration, Ltd., and Wilfred Cassell, a serviceman from Kingston, Ont., offer some advice to Lloyd G. Olan, Canadian Army veteran who is planning to enter the service business in Huntsville, Ont.

MEMBERS OF FIVE COMMITTEES NAMED BY WHOLESALERS

Members of four standing committees and a special committee to handle arrangements for the All-Industry Show next October have been named by the Refrigeration Equipment Wholesalers Association. These committees and their members are:

Manufacturers Relations—George J. Roche, Baltimore, chairman; Ben V. Blazer, Passaic, N. J.; H. R. McCombs, Denver; Alex H. Holcombe, Philadelphia.

Finance—Alex H. Holcombe, Philadelphia, chairman; H. Whiting Holt, Pittsburgh; C. W. Dennis, Sioux City.

Government Contact—Edward C. Marsden, Hartford, Conn., chairman; Irving J. Fajans, New York City; M. J. Trautman, Washington, D. C.

Trade Association—L. V. Branson, San Francisco, chairman; J. P. Glass, Chicago; J. H. Downs, Cleveland; Irving J. Fajans, New York City.

All-Industry Show—J. H. Downs, Cleveland, chairman; J. H. Penske, Jr., Cleveland; N. K. Mason, Columbus, Ohio; J. L. Homan, Dayton, Ohio.

WESCO FORMS NEW NEW YORK DISTRICT

Formation of a new Westinghouse Electric Supply Co. district in the central part of New York state, with H. B. Tompkins as manager, has been announced. With headquarters in Rochester, the new district will embrace Albany, Binghamton, Syracuse, Utica and Watertown.

Mr. Tompkins formerly was manager of Wesco's eastern district. D. J. Byrne, formerly branch manager of the Rochester office, has been appointed apparatus and supply manager of the new district, and E. B. Stearns, formerly branch appliance manager at Newark, N. J., has been named appliance manager.

Other appointments included: Robert H. Douglas, service manager; B. T. Tremaine, promotion manager; H. K. Gleichauf, stores manager, and F. S. Jones, credit manager.

RECTOR BROS. ADD BISHOP FREEZERS

Rector Bros. of Tulsa, Okla., has been named distributor in that area for the Bishop line of food freezers. Earl Rector has resigned from the dairy division of the state department of agriculture to head the firm. His two brothers, Leo and Paul, have just been discharged from the armed services and will join him in operating the firm.

11-WEEK STRIKE ENDS AT DOLE

Shop employees of Dole Refrigerating Co., Chicago manufacturer of Dole vacuum cold plates, returned to work April 1 after a strike of almost 11 weeks, the company has announced. With the plant in full operation, every effort will be made to catch up on back orders as soon as possible, contingent on the availability of materials.

MEET MISS PEERLESS!



This may not be strictly news, but we think you'll agree that it sure is easy on the eyes. The lovely young lady is Miss Betty Thomas, who became well known to those attending the REMA-REWA meeting in Chicago as "Miss Peerless." The obviously approving gentleman is Mel W. Knight, Peerless' general sales manager. Miss Peerless peeks out at you from all the company's advertising these days.

MIDWEST JOBBERS MEET JUNE 7-8

Members of the Midwest Refrigeration Equipment Wholesalers Association will meet June 7 and 8 in Hotel Cosmopolitan, Denver, reports E. L. Bengston, secretary-treasurer. Reservations for the meeting are being handled through Harold McCombs, of McCombs Refrigeration Supply Co., Denver. J. F. Wickham, of Wickham Supply Co., Lincoln, Neb., is president of the association.

COHLER CO. NAMED TEMPRITE AGENT

I. H. Cohler Co., manufacturers' representative with offices in Chicago, has been named sales representative for Temprite Products Corp. in the states of Wisconsin, Minnesota, Iowa, northern Illinois, and northern Indiana.

Mr. Cohler formerly was associated with the commercial sales division of Kelvinator. He has operated as a manufacturers' agent since 1940.

NEW FIRMS ADDED TO MEMBERSHIP OF REMA & REWA

Twelve new members have been added to the roster of the Refrigeration Equipment Manufacturers Association.

These firms are: Baker Ice Machine Co., Omaha, Neb.; Betz Corp., Hammond, Ind.; Chicago Seal Co., Chicago; Electric Power Equipment Corp., Philadelphia; General Machine & Mfg. Co., Berwick, Pa.; Hubbell Corp., Chicago.

Kinetic Chemicals, Inc., Wilmington, Del.; Kold-Hold Mfg. Co., Lansing, Mich.; Lehigh Foundries, Inc., Lancaster, Pa.; Marlo Coil Co., St. Louis; Jas. P. Marsh Corp., Chicago; Peerless of America, Inc., Chicago.

* * *

Four more wholesalers of refrigeration parts, equipment, and supplies have been admitted to the ranks of the Refrigeration Equipment Wholesalers Association. These firms are: County Supply, Inc., Norwalk, Conn.; R & R Parts & Supply Co., Lubbock, Tex.; Texas Refrigeration Supply Co., Ft. Worth, Tex.; United Commercial Sales Co., Los Angeles.

CARGO SHIPS INSTALL SUB ZERO COOLING

Export possibilities for frozen foods have been highlighted by a Carrier announcement that six new cargo vessels being built by Western Pipe & Steel Co., San Francisco, for the American President lines are being equipped with 70,000 cu. ft. of refrigerated space with holding temperatures ranging down to -10°F.

Temperatures in the 13 separately controlled holds of these ships vary from the sub-zero level used for frozen food storage to a high of 55°F. for fresh fruits and vegetables.

On each of the vessels the refrigeration load will be handled by two low-temperature centrifugal units with four-stage turbo compressors. Each of the machines alone will have sufficient capacity to carry the entire load in case the other breaks down.

M-A-D OPENS BRANCH OFFICE IN SYRACUSE

Sixth branch office of Melchior, Armstrong, Dessau Co. has been opened at 234 West Washington St., Syracuse, N. Y. Complete stocks of refrigeration, air conditioning, and oil heating supplies and equipment will be carried.

Matt Kratochwill has been appointed manager of this new branch. Associated with M-A-D since 1937, Mr. Kratochwill recently was released to inactive duty by the Army Air Forces. George R. Simm is returning to the Syracuse office as a sales engi-



"Before I start in—Have you defrosted the unit lately?"

neer. He has been with the organization since 1939, and served in this same capacity before the war.

M-A-D also has added two new engineers, M. G. Johnson and J. C. Crocker, to the staff of its home office in Ridgefield, N. J. Mr. Johnson will serve as a design engineer in the company's program for the manufacture of gravity finned coils. He was with the firm from 1938 until he joined the Army's Corps of Engineers in 1942. Mr. Crocker, an application engineer, was associated with the Crane Co. before joining the Navy.

PURSER AND LONDON FORM SALES ENGINEERING FIRM

John R. Purser Jr. and John B. London, sales engineers of Charlotte, N. C., have joined forces to form Purser & London, Inc. This new firm will do sales engineering work throughout the Carolinas as representative of Yeomans Bros. Co., Chicago.

Mr. Purser formerly headed the J. R. Purser sales engineering firm founded by his father. Mr. London

was recently returned to inactive duty as a Lt. Commander after three years of service in naval aviation engineering.

CALLS GOVERNMENT OUR "BIGGEST BOTTLENECK"

Asserting that the same government which broke many bottlenecks in war production has itself become the country's one and only bottleneck in getting the goods people need to live in peace, H. F. Spoehr, new president of REMA, called on Congress and Washington agencies to take immediate steps permitting his industry "to get materials and go about its business."

Mr. Spoehr declared that the mechanical refrigeration and air conditioning industry has two to three times its prewar productive capacity but is free to turn out only a small part of its prewar volume.

"Our industry is back to the bottleneck," he said. "Today, however, there is only one bottleneck—the government. Lack of materials and strikes, the one practically synonymous with the other, stem from de-

lays in enacting proper labor relations measures. Production and distribution are hampered by delays in getting relief from price controls.

"Most of the production of our industry is in products needed in the preservation of food and in the maintenance of human comfort—refrigeration and air conditioning. These products are badly needed and are in heavy demand. Manufacture of all these products is being held up by one cause or another. Companies with orders on hand for six months production have only a week's supply of raw material. Companies with orders mounting far into the millions are laying off even salaried employees.

"Congress and the government agencies created by Congress can correct these faults—and they should act as promptly as they did during the war to do so."

WILL MANAGE SALES FOR COAST OUTLET

H. B. Reeves, ex-captain in the Army Air Corps, has been appointed sales manager for Coast Refrigeration Distributors, Oakland, Calif., in the northern California area.

STANGARD

Prime Surface

COLD PLATES

For Maximum Refrigerating Efficiency



THE STANGARD-DICKERSON CORP.

46-76 Oliver Street • Newark 5, N. J.

STANGARD KNOWS REFRIGERATION

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but an economic benefit accrues to all concerned, since it eliminates the necessity for specially built tank-cars or bulk containers from which all moisture-laden air, all dust, rust, etc., can be completely excluded during filling and shipment to destination.

Upon arrival the same stringent precautions must be observed while unloading and in bulk storage of the manufacturer if the high dielectric strength is to be maintained. All this

would seem to be an unnecessary expense as well as a practical impossibility.

Relation to Moisture Solubility

Solubility of water in the oil is regarded as significant. Water in solution becomes water in suspension as the temperature of the oil is reduced due to temperature-solubility effect.

Research has indicated that moisture present in an oil up to its saturation point has little if any effect on the dielectric strength. Presence

of moisture above the saturation point, however, immediately causes considerable loss in dielectric strength.

The temperature of course is a factor. If an oil is saturated with moisture at a higher temperature and the dielectric strength is run at a lower temperature, a low value will be obtained at the latter temperature, in contrast with a much higher value which may be observed at the higher temperature.

This indicates the need for dehydration below any moisture content indicated by the dielectric strength test if the oils are to be used in ultra-low temperature service.

Viscosity-Reduction

The ease with which mineral oils will mix or go into solution with the chlorinated or fluorinated refrigerants has fostered a decided interest in the subsequent viscosity of the mixtures. In the beginning, it led to consideration of oils of somewhat heavier original viscosity than subsequent experience proved were necessary.

The fact that a 300 viscosity oil would be reduced to an operating viscosity range in the crankcase of around 90 secs. Saybolt Universal at 100°F., by admixture with ten per cent* of "Freon" or methyl chloride, caused the skeptics to wonder as to the lubricating value of the mixture. To be on the safe side they raised the original viscosity of their oil in an effort to keep their operating viscosity at least 100 secs. at 100°F.

Others, more-willing to investigate the lubricating value of lower viscosity oil-refrigerant mixtures carried out exhaustive laboratory and service tests. The resultant performance of the lighter viscosity refrigerator oils within say a range (undiluted) of 150 to 300 secs. Saybolt Universal at 100°F., has been convincing.

It was definitely indicated that they were capable of affording entirely dependable lubrication even though the viscosity of the lubricating

U.S. INSTRUMENTS Tell The Truth

USG

**PRESSURE, TEMPERATURE,
FLOW, ELECTRICAL AND LEVEL
MEASURING INSTRUMENTS**

6 out of 10
manufacturers of
original equipment
specify U. S. G.

UNITED STATES GAUGE

DIVISION OF AMERICAN MACHINE AND METALS, INC.

SELLERSVILLE, PENNSYLVANIA (1)

*The average ration which prevails in the crankcase of the average compressor is around 10% refrigerant and 90% oil. The oil-refrigerant mixture at the evaporator is just the opposite. This is the reason why a mixture of 10% oil and 90% of "Freon" was adopted for the floc test, because this is the normal amount of oil which has been found to be carried over by the refrigerant after compression.

film was materially reduced by the refrigerant. This has justified the use of such oils by a number of builders who even went so far as to apply the same oil to both "Freon" and sulfur dioxide units.

Before the war the practice was to use an oil of around 150 secs. Saybolt Universal viscosity for small refrigerating systems of the slow speed, enclosed type, operating with a flooded evaporator; stepping up to around 300 viscosity for expansion systems.

As speeds and loads were increased, an increase in viscosity was considered advisable. Viscosity up to around 500 secs. was desirable in such units. Capacity and type of compressor (whether air or water-cooled) principally will govern the viscosity of oil which should be used.**

How Miscibility is Affected

In studying this matter of mutual solubility of mineral lubricating oils with "Freon" refrigerants, methyl chloride or the Carrenes, it is essential to understand that the physical nature of the refrigerant is all-important.

In the liquid phase, all these refrigerants are entirely miscible with petroleum oils. When such refrigerants are in the gaseous phase, however, the oil being almost entirely liquid absorbs only a small portion of the gas. In other words, the respective refrigerant vapors will go into solution less readily, all dependent upon the prevailing pressures and temperatures.

The petroleum technologist, in studying this phenomenon, endeavored to duplicate operating conditions as far as possible in the interest of improving lubrication, while at the same time protecting the lubricating ability of the oil.

The amount of any such refrigerant which may be absorbed by a mineral oil will be dependent also upon the viscosity of the oil at the temperature of contact.

The viscosity bears a relation in that as it is increased the amount of refrigerant absorbed will decrease. In turn, larger amounts of "Freon", Methyl chloride and Carrene are absorbed by mineral oils at higher pres-

sures and lower temperatures, just as smaller amounts will be absorbed at lower pressures and higher temperatures.

THE TREND TO LOWER TEMPERATURES

Stratosphere flying during the late war required more thorough knowledge of the performance of aircraft materials under temperatures ranging from -67°F. to -100°F. or even lower, and the effect of these temperatures upon human reactions.

To be sure, flyers were not always directly exposed to such extreme cold, as plane cabins were heated. But when bail-out was necessary, the crew had no control over the altitude at which they had to jump.

Stratosphere temperatures, therefore, were approached in most of the test units which were developed. These units will have a definite place in peace-time production. What research learned during the exigencies of war should be of even more lasting benefit thereafter. Medicine, metal assembly, petroleum research, and

DAVISON'S
Refrigeration Grade
SILICA GEL

STOPS MOISTURE TROUBLES!

When you use Davison's *Refrigeration Grade* Silica Gel for moisture trouble, you eliminate "no charge" call backs! You can leave a cartridge charged with Davison's *Refrigeration Grade* Silica Gel in the line and know it'll go right on, doing its job, for YEARS!

In addition to removing moisture, it removes acids and corrosive compounds instantaneously. Its scientifically-determined particle size is maintained under all conditions within the cartridge. That means it will not channel the refrigerant, powder, dust, swell nor change in any way. Davison's *Refrigeration Grade* Silica Gel was developed years ago, specifically as the ideal drying agent for refrigerants of all types. It has continued to set the standard for drying agent performance.

Your jobber has Davison's on hand, either in bulk or in factory-charged dehydrators. Ask his advice . . . he'll tell you Davison's *Refrigeration Grade* Silica Gel is the original and standard drying agent. LOOK FOR THE CAN WITH THE BLUE LABEL!

THE DAVISON CHEMICAL CORPORATION
Progress through Chemistry

BALTIMORE-3, MD.

**R. J. Thompson, "Freon-12", Tech. Paper #11, Kinetic Chemicals, Inc., Wilmington, Del., p. 16, p. 17.

Canadian exclusive sales agents for DAVISON'S SILICA GEL:
CANADIAN INDUSTRIES, LIMITED, General Chemicals Division

precision mechanisms, all will profit.

In Medicine

Freezing of blood plasma down to temperatures around -100°F . was the first application of very low temperature to medicine. From a laboratory experiment it rapidly became a standard method of procedure during the late war.

Shell freezing produces the best dried product. This is a process whereby the plasma is frozen on the inner surface of a bottle to form a

layer or shell of plasma of uniform thickness.*

Research has also developed that surgical operations can be performed on human tissue by freezing the parts to be operated on down to around stratosphere temperatures. Local anesthesia by freezing is claimed to reduce the possibility of shock to nervous systems.

Refrigeration likewise has contributed to the production of Peni-

*Lt. Col. D. B. Kendrick explained this method in detail before the annual meeting of the A.S.R.E. in Phila., Pa., Dec. 7, 1948.

cillin, being applicable to storage of the product after freezing, where temperatures around -70°F . are quoted.

In Metals Assembly

The aircraft industry proved the value of refrigeration in metals assembly, using aluminum, when their research people found that by chilling rivets and sheets down to around -50°F . or below to prevent age hardening, they could speed up materially the assembly of many fuselage and wing sections.

Interesting physical changes in other metals occur when chilling or low-temperature quenching is practiced. Magnetic qualities are improved; hardness is increased and more permanent volume increase has been observed when the chilled parts have been brought back to normal temperatures—all related to the stabilization of metals. This is most important where strength, ductility and maximum wear resistance are desirable.

Temperatures as low as -130°F . are mentioned in the literature in connection with such work. It is predicted that -200°F . may be approached in the not too distant future. Considerable work is necessary to correlate the refrigerating system, the refrigerant and the lubricating oil in the interest of more dependable operation of the system as a whole.

Precision Mechanism

Instrument testing which came about as a result of stratosphere flying has gone beyond the scope of merely testing instruments for aircraft operation at stratosphere temperatures. Low temperature cold rooms were perfected wherein pressures and temperatures could be accurately regulated so that radio equipment and other vital control devices could be tested under conditions virtually identical with those encountered in service.

Low temperature cold rooms also enabled study of automotive and aircraft engine starting ability for Arctic service.

Function of the Cold Room

The cold room is a most important part in a petroleum research laboratory. Therein the petroleum technologist can study the performance

HOMESICK CYLINDERS

If cylinders could sing, a hit tune in their repertoire would be "Carry Me Back to Old Virginia."

It's a mighty empty feeling to be a long, long way from home, with nothing to do—but there's plenty of work waiting for VIRGINIA Refrigerant cylinders; so have a heart, Mister. If there's an empty, homesick cylinder around your place, have a look on the shoulder.... If you find "VSCo" stamped there, please start it on its way back to VIRGINIA, home of EXTRA DRY ESOTOO (Liquid Sulfur Dioxide) and V-METH-L (Methyl Chloride).

Distributors of "Freon" Refrigerants
11, 12, 21, 22, 113

VIRGINIA
SMELTING COMPANY
WEST NORFOLK, VIRGINIA
NEW YORK • BOSTON • DETROIT

CARRY ME BACK TO OLD VIRGINIA

of engine oils, fuels, gear lubricants, and greases on full size equipment. Practical experience in the use of refrigerator oils in ultra low temperature service is thus available to the research personnel.

For years before the war the cold room saved endless hours of winter research (uncertain at best); in the post-war period with cold rooms which can be chilled to nearly -100° F., petroleum research will keep pace with metallurgy, chemistry, and refrigeration in producing lubricants which will function dependably at away below zero to away above.

It was natural that all this low temperature requirement placed the petroleum industry in a tough spot at first. Refrigerating machinery was available to attain these temperatures. Refrigerants had been developed which made this economically practicable. Were lubricating oils available which would not stop up the expansion valves when the temperatures were reduced down to around -80° to -100° F?

Fortunately, refrigeration is an important function in the manufacture

of petroleum lubricating oils. Cold treatment or chilling is employed in the removal of non-lubricating paraffinic wax hydrocarbons.

Characteristics Studied

The petroleum technologist, therefore, had available the ways and means to study the essential characteristics of refrigeration grade oils. He could direct his research toward the study of those hydrocarbons which precipitate out at very low temperatures. He could investigate their relation to moisture. He could confirm the opinions of authorities that moisture in any part of a refrigerating system is bad; what effect it may have upon the precipitating tendency of wax still is not too well known.

Where refrigerants are used which are in themselves dewaxing agents, there is still work to be done in establishing more dependable tests which will predict the suitability of the oil; i.e., how much wax is permissible? What is the minimum temperature of test? How can the machinery builders cooperate in designing their equipment to function

more dependably at these temperatures in the evaporator on oils which will not require too drastic refining with attendant higher cost oils? What is the minimum and maximum operating viscosity?

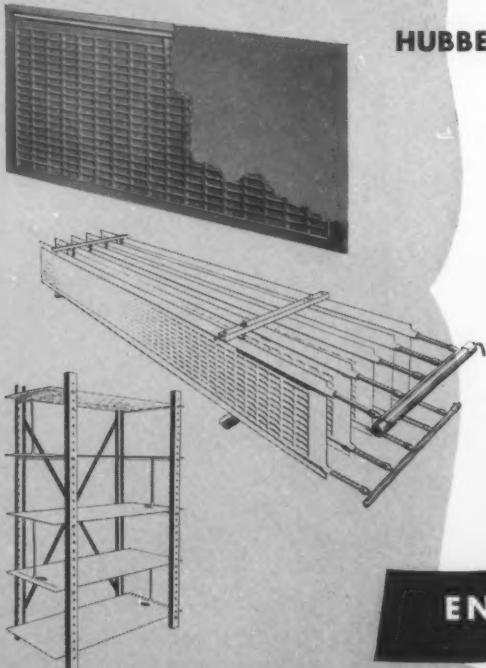
All this is not truly predicted by the pour point test of the oil itself or the floc test. The pour point is not a guide as it is made on the undiluted oil, and at very low temperatures the oil may cease to flow due to viscosity even though it may be wax-free.

With respect to the floc test, it has been demonstrated that one oil having a relatively high floc test, i.e., -30° F., may be entirely satisfactory at temperatures below -100° F. whereas another oil with a much lower floc test (-60° F.) may be entirely unsuitable at temperatures below -60° F. due to excessive wax precipitation. The floc test as run today on a 10% oil-90% refrigerant is a good practical test but it requires interpretation.

NEW SERVICE FIRM

J. L. and Darrel Robinson have opened Robinson Refrigeration Service at 410 1/2 E. 7th St., Okmulgee, Okla.

NEVER MIND HOW GOOD YOU USED TO BE—HOW GOOD ARE YOU NOW?



HUBBELL-YODER full flooded plate refrigeration meets the challenge of this atomic age

FROM a purely technical angle, it's the fastest temperature pull-down you ever saw.

More specifically, it's the system of mechanical refrigeration which circulates the refrigerant through a network of ducts criss-cross each other in all directions thus literally "flooding" the length and width of the interior of the plate with a web of refrigerating element. Every square inch of the entire area of a Hubbell-Yoder Full Flooded Plate is prime pick-up surface.

This is refrigeration performance geared to the stepped up standards of this new era. There is no point in comparing its efficiency with prewar refrigeration practice because there just isn't any comparison. Low temperature equipment such as freezer cabinets, locker plant plate banks, sharp freeze shelf stacks, fruit and vegetable counters, etc., whose refrigeration units bear the Hubbell-Yoder trade mark is simply in a class by itself. If you make, sell or use such products it will pay you to get the clear facts about these sensational plates. Write, wire or phone.



International Sales Agents
ENGINEERING SERVICE INC.

1311 West 80th Street

Cleveland 2, Ohio

EXTRA PROFIT
on every job

Standard and Special



Contractors, service organizations, and equipment dealers can make an extra profit on every job by selling Albert H. Bromann Jr. refrigeration products. . . . Sold only through recognized, established outlets.

Write on your business letterhead for complete information.

ALBERT H. BROMANN JR.
SCHILLER PARK, ILLINOIS

**REFRIGERATION
PRODUCTS**

Cells for Refrigeration
Cells for Air Conditioning
Air Conditioning Units
Humi-Temp Forced Convection
Units
Polished Aluminum Disseminators
for Plants
Electrolytic Cells
Evaporative Condensers
Industrial Coolers
Water Coolers

Write for
Catalogue



LARKIN COILS
519 Memorial Dr., S. E.
ATLANTA, GA.



Veteran-students Stanley J. Guzik, Lowell K. Knauf, Gerald G. Hough, and Louis Pierce test pressures on an electric refrigeration unit in the basic refrigeration class conducted for discharged servicemen at Cleveland's East Technical High School.

• • •

VETS LEARN FAST

EIGHTEEN war veterans have begun the study of the elements of refrigeration in a special course established recently by the Cleveland Board of Education—the first class in that subject set up exclusively for one group in a daytime curriculum in the city's public school system.

The veterans, whose ages range from 18 to 29, are planning to become experts in the repair and service of refrigerators, while others are interested in working with cold storage outfits; a few have expressed an interest to go into sales work.

The class was established by the school board at East Technical High School in response to a request by Robert H. Owens, supervisor of veterans' education in the Cleveland public schools, who had been petitioned by many veterans wanting such training.

First Day Class

"We have taught refrigeration at East Technical High School in night classes," said Mr. Owens, "but this is the first day class exclusively for G.I.'s. It's a one semester course called 'Elementary Refrigeration—Theory and Practice.'

"The results have so far been very encouraging. The men have seemed intensely interested in the work. In fact, we were surprised at the reaction of the students."

Instructing the veterans is Merrill D. Spurrier, himself a veteran. Mr. Spurrier has taught at the high school since 1929, principally machine shop and automobile repair and related work.

Students Work Hard

"These students of mine are determined to make a success of this work; listen to them talk," Mr. Spurrier said, pointing to a group discussing a problem in a corner of the classroom shop. "They know what they want and they are going after it the same way they did in the service when they were told to do something."

The class meets daily from 9 a. m. to 3 p. m. The veterans are being taught hard soldering and electricity as it applies to motors and all parts of an electric refrigerator. They also are being shown the use and functions of pressure gauges.

HARRY ALTER CO. ADDS NEW PERSONNEL

A number of new appointments have been announced by the Harry Alter Co., Chicago wholesaler, to fill out the personnel of the company's two divisions.

The radio and major appliance division, covering metropolitan Chicago markets, is headed by vice-president, Arthur S. Alter, recently discharged as a Lieutenant Colonel from the Army. H. C. Huebner is general sales manager of this division; Max Geisler has been appointed sales promotion manager. W. L. Wood continues in charge of service.

Irving Alter, secretary and treasurer of the company, acts as general manager of the refrigeration parts distributing division. Leo Alter, vice-president, heads up Eastern operations for the company. Joseph R. Novotny, who prior to the war was

THE man who sold at retail the first General Electric household refrigerator produced commercially, 'way back in 1925, has retired after 46 years of service with the company. He is Herbert H. Bosworth, who joined G-E in 1899 at the West Lynn works, and who for the last 10 years has maintained headquarters at Nela Park, Cleveland.

In 1927, when G-E's refrigeration department was organized, Mr. Bosworth was named manager of central station sales, and since then he has worked closely with electric power companies throughout the country.

purchasing agent for the company, has been appointed advertising manager. He has just rejoined the company after spending three years in the Navy.

The following are new appointments in this division: Ted Robateau, purchasing agent; Fillmore Weinstein, an Army veteran, merchandise manager; Alex Port, export manager. Harry Bernhart, city sales manager, will supervise the activities of the following city salesmen and countermen: Joseph Kaplan, recently discharged from the Navy; Joe Holub, formerly in the Field Artillery; Steve Majeski; Leonard Sostrin, an Army discharger; Harold McClure, also recently discharged from the Army; and Joe Koncak.

Haley Lang has been appointed general operating manager of the Chicago warehouse, John McGovern, manager of the receiving department, and J. H. Carava manager of the parts

and supply department.

Warren R. Kahn, newly discharged from the Army, has been appointed manager of the eastern division. Martin W. Kent continues as manager of the New York branch. Recent additions to the sales staff of the New York branch are Murray Addinoff and Armond Nelson, both discharged veterans.

Harry Alter, who continues as president, reports that practically all employees who joined up with the services during the war have returned and have been re-employed.

"BEFORE-AND-AFTER" pictures of electric kitchens, air conditioned business places, and other refrigeration applications are now possible in a single photograph by means of a "Selectograph" process recently announced by Polaroid Corp. The process enables two photos to be reproduced, one over the other, in a single light-polarized print. To "unscramble" the views, a simple double-window or eye-piece of Polaroid plastic is used.

In salesmen's portfolios, for example, the device can be used for removing the housing of a compressor pictorially to expose the "insides," in addition to use in before-and-after installation presenta-

CHICAGO SEALS
GO ON THE SHAFT
WITH EASE AND SPEED
AND CUT DOWN "CALL BACKS."
THAT'S HOW THEY PUT MORE
PROFIT IN EVERY JOB

MODERN
DESIGN



CHICAGO GENERAL
REPLACEMENT SEAL



ONLY CHICAGO VALVE PLATES
HAVE REPLACEABLE VALVE SEATS.
SIZES FOR MOST COMPRESSORS.

Sold By Jobbers

CHICAGO SEAL CO. 20 N. WACKER DR., CHICAGO 6, ILL.



There's an Aerovox exact-duplicate or universal replacement for every motor-starting capacitor.

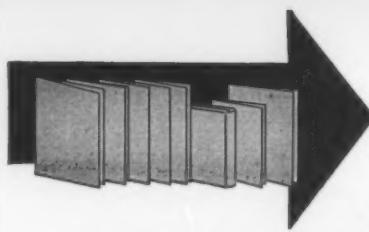
Aerovox listings help you select the proper replacement type for any standard capacitor-type refrigerator motor.

The Aerovox jobber or supplier carries a stock for your convenience. Ask for latest catalog. Or write us direct.



FOR RADIO-ELECTRONIC AND
INDUSTRIAL APPLICATIONS

AEROVox CORP., NEW BEDFORD, MASS., U.S.A.
Export: 13 E. 40th St., New York 18, N.Y. • Cable: 'ARLAB'
In Canada: AEROVox CANADA LTD., Hamilton, Ont.



Useful Literature

The publications listed below are available to readers without charge. Simply list on the postcard provided in this issue the numbers of the items you wish to receive, and send it to THE REFRIGERATION INDUSTRY, 1240 Ontario Street, Cleveland 13, Ohio. Your requests will then be forwarded directly to the companies concerned.

289—Water Coolers . . . A folder (No. 185) with photographs, specifications, and dimensional charts of the "Oasis" line of water cooling equipment. Available from Ebeco Mfg. Co.

290—Reach-in Refrigerator . . . A broadside giving complete specifications and dimensional diagrams of the commercial reach-in refrigerator manufactured by Herrick Refrigerator Co.

291—Household Evaporators . . . A data sheet and price list for the "Standar" line of stainless steel evaporators for household refrigerators. Available from Standard Refrigeration Co.

292—Refrigeration Instruments . . . A new 20-page, pocket-size pamphlet illustrating and describing the complete line of gauges and thermometers manufactured for refrigeration service work by the Jas. P. Marsh Corp.

293—Stainless Steel Bellows . . . A 12-page booklet (No. SSB-46) containing numerous diagrammatical cross-section views and detailed data concerning the use of stainless steel bellows as equalizers, compensators, expansion joints, flexible connectors, electrical controls, and in other applications. Available from Chicago Metal Hose Corp.

294—Motor Service . . . A 12-page illustrated booklet (No. B-3711) describing three service plans providing for motor exchange, shop repair, and national service covering fractional horsepower motors. Available from Westinghouse Electric Corp.

295—Liquid Cooler . . . A bulletin (No. 100) describing and illustrating the "Niagara" liquid cooler for temperature control of chilled water or solutions. Available from Niagara Blower Co.

296—Alloy Valves . . . Technical bulletin (No. 2) describing and giving specifications of "Aloyco-20" and valves made from this alloy. Available from Alloy Steel Products Co.

297—Bearing Bronze . . . A 21-page booklet, entitled "Men and Metals" and illustrated with woodcuts reproduced from a 16th century text on metallurgy, which tells the story of the development of the Saginaw Bearing Co. and the particular type of bronze this firm uses.

298—Frozen Foods . . . A 32-page booklet on the selection and preparation of foods for freezing and on the cooking and serving of the finished product. Available from Frigidaire Division, General Motors Corp.

299—Pipe Threads . . . An eight-page booklet containing information on "Dry-seal" pipe threads, explaining what they are, how they work, and recommended procedures for using them. Available from The Weatherhead Co.

300—Air Filters . . . Technical data sheets on "Research" filters for air conditioning systems, giving efficiency and capacity ratings and resistance factors. Available from Research Products Corp.

301—Expansion Valve . . . A pocket-size folder describing the V-200 thermostatic expansion valve manufactured by General Controls, with schematic diagram emphasizing its "6 in one" features.

302—Cooling Units . . . A 16-page brochure outlining the advantages of the "Filterpure" line of cooling units, giving data on specific models for general cooling, walk-ins, reach-ins, dough retarders, back bars, and beverage boxes. Available from Betz Corp.

303—Insulation . . . A booklet describing applications of insulating materials for fruit and vegetables storages and offering tips on design and construction of such storage units. Available from Armstrong Cork Co.

304—Tube Cutter . . . A folder listing the advantages of the "Dura-Keen" tube cutter and other tools for fabricating tubing. Available from Parker Appliance Co.

305—Coils and Coolers . . . A catalog (No. 1-K) listing the features and applications of the "O-Kay" line of coils and unit coolers and containing several pages of engineering and application data relative to these products. Available from Kay Products Co. Division of Tyler Fixture Corp.

FOR use by colleges, trade schools and manufacturers' service schools, Henry Valve Co. has available educational wall charts, featuring cross-section views of typical accessories used in refrigeration and air conditioning.

The text is factual and informative, and the charts contain no advertising. Firms and institutions who want the charts should make application on their own letterheads to Henry Valve Co., 3260 W. Grand Ave., Chicago 51, Ill.

NEW TOPEKA DEALERSHIP

Midwest Appliance Co. was recently opened at 609 Kansas St., Topeka, Kan. John Humpage is owner.

Mr. Serviceman: Can You Keep

IN STEP WITH THE TIMES

THERE was much ado concerning the refrigeration industry's effort and necessity during the war, but now that the war is over I feel that many people are prone to view the future with a tremendous amount of alarm. My own view at the present time, however, is that of a challenge to all of us—particularly those of us in the refrigeration industry.

The real worth and value of the refrigeration service man again is being proved through the present drives to conserve food in this country in order that we might be able to ship as much as possible to the less fortunate people of other countries. Our nation at large is saving tremendous tonnage of food through use of our present refrigeration equipment, and your knowledge and work in keeping all of our equipment, large and small, in running condition, surely is contributing to many thousands of saved lives in the starved war-torn countries.

Self-Adjustment Needed

We also have many obligations to ourselves, and surely one of these is to adjust our physical and mental processes so that we may keep pace with the many phases of change which are now in progress.

There is, of course, plenty of work for all engaged in our industry at the present time. As a matter of fact, most of you can choose your jobs or customers and practically charge as much as you want to for your services.

I know, however, that most of you are conservative and are doing the best you possibly can to create lasting satisfactory relationships between your customers and yourselves. For as many of you undoubtedly have recognized, the over-charged customer merely switches from one source of supply to another, even though at times he might be charged even more as a result of this change.

(Digest of an address presented by Herman Goldberg, of Herman Goldberg Co., Chicago, at the Wisconsin RSES convention in Madison, Wis., March 16, 1946.)

It is my opinion that the road for profitable service work is, and will be, clear for quite some time, and that the average conscientious service man or organization will enjoy abundant business opportunity for quite a while.

However, it is well to recognize that the law of supply and demand always equalizes for a period before it goes into a see-saw reversal. In other words, right now there is a tremendous demand for your services, and there is a shortness of materials. The demand, primarily, is here because of the great need to maintain and increase the efficiency of present equipment, which might have been replaced by now had the manufacturers been able to assemble new equipment for those now ready to buy.

It stands to reason that when the large manufacturers go into their tremendous production schedules, the units which they will manufacture will replace systems which now are in need of constant care or service work. As these manufacturers sell these well-constructed, finely-precisioned units, they will resume their guarantees of

pre-war days, and a good bit of service work will be taken from your present general trade.

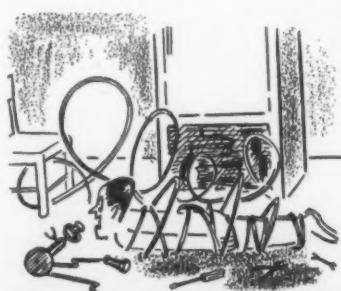
The mere fact that these new refrigeration units will have to be sold and installed, to a great extent means new opportunity, because you will have a lot to do with sales and installation of new equipment.

The trained men to handle these ideas, which now mainly are past the drawing boards, are none other than yourselves. It is foolhardy to think that it is possible for men taught in schools alone to have full and complete knowledge of refrigeration, unless they have had practical years of experience, too.

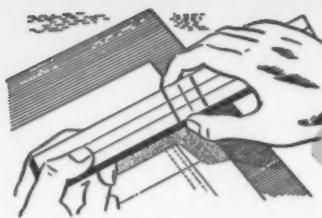
Beginners Can Teach

While there are many young men now going to school who are gaining skilled preparations to enter the refrigeration field, it is their thought, mainly, to tie themselves in with men of practical experience, because they recognize that the new things which they will learn at school are merely additions to the many things about refrigeration which you men have learned in your practical contact with the jobs in the field.

There will be many new people entering your fields, and if you make the mistake of fearing them as possible competitors for the prestige which you have already gained through servicing refrigeration units, you will gain nothing from their learning. But if you will accept them on a broad basis—accept their learning and make way for positions through which they will be able to work with you—you will acquire some new knowledge about refrigeration and coming new types of cooling which are not as yet really being manufactured. Through the very means of allowing opportunity to newcomers, you yourselves will keep in pace with the refrigeration systems of tomorrow.



"Aee Service? I'm all wound up in a problem over here and . . ."



For further information on any of these products, simply list the key number at the head of each item on the special post card enclosed with this issue.

Soldering Iron • • • • P-63

Product: "Eject-O-Matic" automatic-feed electric soldering iron.

Manufacturer: Multi-Products Tool Co., Newark, N. J.

Features: Trigger operated, ejects a measured amount of solder from reel concealed in handle. Amount of solder regulated by micrometer adjusting wheel near operator's thumb.



Pistol-grip handle of molded bakelite. Tool weighs 1 1/4 lbs. loaded. Tip is replaceable, non-corrosive. Special stand can be used as guide on fine work.

Germicidal Lamp • • • • P-64

Product: Type B germicidal lamp to prevent contamination of foods.

Manufacturer: Sylvania Electric Products, Inc., Salem, Mass.

Features: Suitable for use in meat storage refrigerators, air conditioning ducts, packaging, canning, jar-filling operations. Available in 15 and 30 watt T-8 sizes, for ceiling or wall mounting.

Frozen Food Dispenser • P-65

Product: Self-service frozen foods dispensing case.

Manufacturer: Frosted Food-O-Mat Co., Glenshaw, Pa.

Features: Automatically delivers to shopper one to 20 varieties of frozen

foods when proper buttons are pushed. Defrosting of cabinet walls is eliminated by patented air conditioning principle.

Low Temp Line • • • • P-66

Product: Home and farm freezers, low temperature walk-in cooler.

Manufacturer: McCray Refrigerator Co., Kendallville, Ind.

Features: Freezer line includes 6, 12 and 22-cu. ft. models, two largest having freezing compartments in addition to storage space. All units have lift lids, chrome hardware, hermetically sealed refrigerating units, Delux interior and exterior, 4-in. Fiberglas insulation.

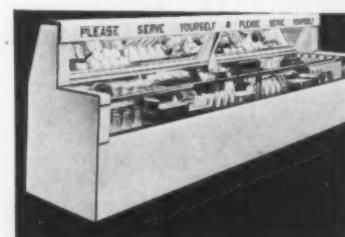
Walk-in cooler (Model LT-777) will have interior and exterior of metal finished in aluminum paint, 6-in. Fiberglas insulation, seven-plate freezer stand installed against back wall. Refrigerating equipment includes heat exchanger, drier, two expansion valves, plus condensing unit.

Self-Service Case • • • • P-67

Product: Open type self-service meat and dairy display case for retail stores.

Manufacturer: Tyler Fixture Corp., Niles, Mich.

Features: Three-step shelf arrangement provided for dairy display use,



full-width porcelain false bottom for meat case use. Non-glare fluorescent lighting, double glass front with stainless steel rub rail, rust-proof welded steel outer shelf; insulation, 3 in.; method of coiling permits access to case through rear swinging door and

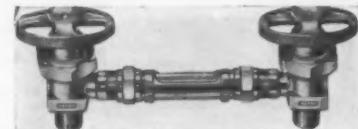
mirror combination, an exclusive feature. Available in 8 ft. and 12 ft. lengths.

Gauge Set • • • • P-68

Product: Gauge glass set.

Manufacturer: Henry Valve Co., Chicago.

Features: Set uses Henry diaphragm packless valves, eliminating valve stem packing. Recommended for installation on accumulators, li-



quid receivers, oil reservoirs, other installations in which there is surging or splashing within vessel. Safety ball check in each valve protects liquid and pressure in event of glass tubing breakage. Tubing rated at 500 psi (cold) for lengths to 10 in.; 420 psi, 11-20 in.; 340 psi, 21-24 in. Standard tubing length, 12 in.; exposed length, 10 in. Other lengths available on special order.

Water Cooler • • • • P-69

Product: "Oasis" Model OP-10 electric water cooler.

Manufacturer: Ebcu Mfg. Co., Columbus, Ohio.

Features: Steel cabinet, one-piece wrap-around construction, brown la-



quer exterior finish. Stainless steel splashproof top, rounded corners; glass filler connection installed, outlet can be added in field. Bubbler has self-closing valve and automatic stream control, lever handle for easy operation. Bubbler guard is chrome plated. Copper alloy tank-type cooling unit, with refrigerant coils bonded to tank; patented by-pass relief pro-

tests against freeze-up. Waste-water type pre-cooler; 2½ in. ground cork insulation, hydrolene sealed. Hermetically-sealed Freon-12 condensing unit, ½ H.P. motor. Cooler is equipped for remote bubbler installation.

Ice Cubers • • • • P-70

Product: Ice cuber, combination refrigerator-freezer-ice cuber, commercial ice cuber.

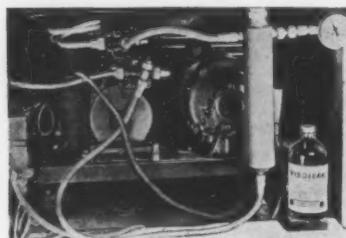
Manufacturer: John C. Wilson Co., San Francisco.

Features: Adaptable to kitchens or bars in private homes as well as commercial uses such as restaurants, bars, clubs, resorts, hospital, other institutions. Commercial ice cuber turns out 120 cubes every 30 minutes.

Charging Set • • • • P-71

Product: "Visoleak" charging set. **Manufacturer:** Western Thermal Equipment Co., Los Angeles.

Features: Useable for injecting "Visoleak," adding refrigerant oil, re-



charging sealed units. Simple in design, designed to withstand rugged use by service men. Trade price for charging set complete with hoses, \$7.50; for filler only, \$6.

Food Freezers • • • • P-72

Product: Horizontal and vertical type food freezing and storage cabinets.

Manufacturer: Ben Bar Sales, Inc., Milwaukee.

Features: Horizontal models have capacities of 14.1 cu. ft. (500-700 lbs.) and 18.7 cu. ft. (700-900 lbs.), vertical model has 13.6 cu. ft. capacity. Walls, backs, tops are of Transite, floor of 20-gauge steel. Insulation is 4 in. Fiberglas. Horizontal models have ¼ H.P. compressor mounted atop cabinet; cold plates are freezing medium. Vertical model has 15 x 18 in. vacuum plate as top freez-

ing shelf, 28 x 35 in. plate mounted on back wall. Adjustable controls on all models.

Special Faucet • • • • P-73

Product: Special type faucet to provide fresh cold running water direct from refrigerator.

Manufacturer: Economy Faucet Co., Newark, N. J.

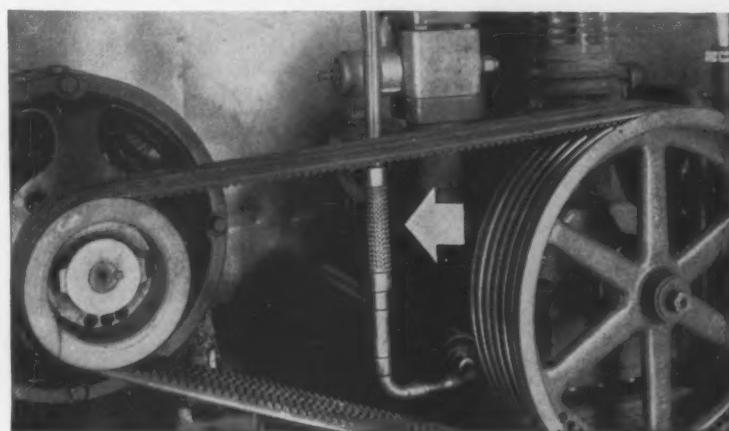
Features: Faucet and internal cooling coil comprise entire assembly.

Spout operates on swivel attached to side of box, delivering water as soon as spout is swung out from its compartment. Turning spout to left shuts off water. Device may be installed on both existing and new units.

Home Freezer • • • • P-74

Product: Upright type home freezer.

Manufacturer: Gibson Refrigerator Co., Greenville, Mich.



REX Vibra-Sorbers Reduce Vibration Hazards

REX VIBRA-SORBERS—properly installed—substantially reduce servicing costs. For **REX VIBRA-SORBERS** have the exceptional strength and flexibility needed to absorb prolonged vibration and thus prevent the transmission of noises throughout the entire piping system.

In addition, **REX VIBRA-SORBERS** are pressure-tested to insure "refrigerant-tightness." This means greater protection against

leakage of valuable refrigerants. **REX VIBRA-SORBERS** of copper bearing alloy are normally used for Freon and Menthol. Units of steel alloys are available for ammonia. Thus, effective corrosion resistance is assured in all types of installations.

Let experienced C. M. H. engineers help solve your vibration problems. Write today for full information.

Flexible Metal Hose for Every Industrial Use



Plants: Maywood and Elgin, Ill.

Features: Cabinet is 66 in. high, 30 in. wide, 27 in. deep. Unit has five compartments, four $6\frac{1}{8}$ in. high, one $12\frac{5}{8}$ in. high, all $21\frac{1}{8}$ in. wide, 14 in. deep. Temperatures average 0 to 5°F. Reciprocating hermetic compressor; Freon refrigerant. Interior acid-resistant porcelain, exterior baked-on enamel.

Home Freezer • • • • P-75

Product: Two upright and two horizontal type home freezer models.

Manufacturer: Philco Corp., Phila-

delphia.

Features: Upright models, in $7\frac{1}{2}$ and 10 cu. ft. sizes, have three sub-zero storage sections, one for sharp freezing. Temperatures down to -25°F . are possible. Both models have new type sloping shelf with two-position door, outer door latch with built-in lock.

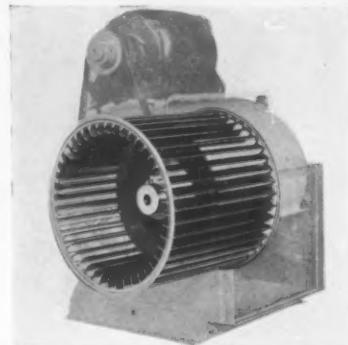
Horizontal models (2 $\frac{1}{2}$ and 5 cu. ft.) will maintain temperatures from -15 to -25°F .; larger unit has three sub-zero sections, one suitable for sharp freezing. All models have warning bell in event of power stoppage.

Blower Wheel • • • • P-76

Product: Series "A" blower wheel.

Manufacturer: Lau Blower Co., Dayton, Ohio.

Features: Made especially for Lau Series "A" blowers, but also available separately. Center suspension type,



with deep blades proportioned for maximum efficiency; each blade is locked mechanically to center disc. Narrower end ring permits greater air flow into wheel; end rings are assembled and locked to blades in a spinning operation. Patents applied for on all special features.

Air Conditioners • • • • P-77

Product: Packaged air conditioning units 1 to 5 H.P. capacity.

Manufacturer: Westinghouse Electric Corp.

Features: Redesigned units have been reduced up to 15% in size, and weight of 5 H.P. model has been reduced 20%, making installation easier. All component parts are mounted on rigid structural chassis with panels removable for inspection and servicing. Air-supply grille is interchangeable for either vertical or horizontal air flow. Sealed compressor unit has been redesigned for 2, 3 and 5 H.P. models, with cylinders in 90-degree "V," and rotating parts dynamically balanced for smoothness.

Water Cooling Units • • • P-78

Product: Instantaneous water coolers for commercial and industrial uses.

Manufacturer: Potter & Rayfield, Inc., Atlanta, Ga.

Features: Designed primarily for beverage bottling plants, but applicable to other water cooling uses. Capacities range from 75 gal. (with 3 H.P.



Photo courtesy of Edwin L. Wiegand Co., Pittsburgh, Pa.

The fast, low-cost way to make WATER-TIGHT joints



At right, above, you see the formed tubes. Between and around the EASY-FLO rings on tube ends, inserts ends in flame. Wires and applies Handy Heat. While the tube and other assembly in the induction coil (center) is braised. At left, the tube is shown in its finished assembly. With the flame fixture she turns out a steady stream of reliably braised bottoms.

For making water-tight metal joints on a commercial basis, brazing with the low-temperature silver alloy EASY-FLO is your answer on a wide range of jobs. And here are the two main reasons why: 1.—EASY-FLO brazing consistently makes joints that are just as water-tight and just as strong and lasting as solid metal. 2.—EASY-FLO brazing lends itself readily to simple production methods through which ORDINARY LABOR can reliably turn out these strong, water-tight joints at FAST RATES—all of which assures LOW COSTS.

One good example comes from the Edwin L. Wiegand Co. of Pittsburgh—the EASY-FLO brazing of their widely used CHROMALOX Immersion Heaters. Wiegand engineers worked out the simple procedure illustrated, for brazing the formed copper tubes to the copper-clad steel flanges which produces the required 100% water-tight joints with speed, reliability and economy.

GET FULL EASY-FLO FACTS IN BULLETIN 12-A

It explains exactly what this alloy does and why. Also tells you where and how you can profitably put EASY-FLO to work on your own metal joining. Write for a copy today.



Bridgeport, Conn. • Chicago, Ill. • Los Angeles, Cal. • Providence, R. I. • Toronto, Canada

Agents in Principal Cities

compressor to 250 gal. (with 10 H.P. unit). Tank and compressor (Brunner) mounted on single base; requires only water and electrical connections for installation.

Saw Attachment • • • P-79

Product: Attachment to metal cut-off saws to enable fully automatic operation, rather than manual.

Manufacturer: Machine Specialties, Chicago.

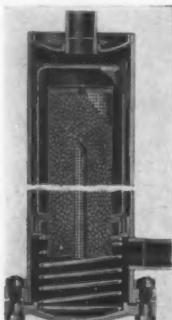
Features: Sold as complete package unit, ready for installation. Includes pull-up device, vise clamp mechanism, saw lifting and lowering device, length control valve. Will cut any length from $\frac{3}{16}$ in. up without attendant. Change back to manual operation can be made by turning hand valve in air line. Automatic attachment works from air pressure lines as low as 60 lbs. Units available for most of more widely used metal cut-off saws.

Strainer-Filter-Drier • • P-80

Product: Combination strainer-filter-drier for mobile refrigeration installations.

Manufacturer: Henry Valve Co., Chicago.

Features: Dehydrator is renewable with factory-sealed cartridge; filter is

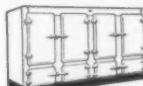


locked on dehydrant cartridge by snapring, drier-filter assembly is held in place by compressed spring to prevent by-passing. Flange removable for access to filter-drier elements. Screen area, 136 sq. in. Volume of dehydrant, 50 cu. in. Shell diameter, $3\frac{1}{8}$ in. Recommended for systems to 5 H.P. Standard drying agent: silica gel. Sizes: $\frac{5}{8}$ in. and $\frac{3}{4}$ in. O.D. tubing connections.

WHY EXPERIMENT?

**ZEROCEL WILL
DO IT BETTER!**

INCH for inch, Zerocel is one of the most EFFICIENT insulators for almost every kind of low-temperature insulation. Its properties are perfect for locker plants, home and farm freezer cabinets, domestic and commercial refrigerators and in short, for practically all types of low temperature construction. It has a thermal conductivity (or "K" factor) of only 0.24 Btu. at 60° F. mean temperature.



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Zerocel is so ECONOMICAL you can install it much thicker than ordinary insulations for the same or less money. Therefore, you can reduce your refrigeration load (and also the size of your compressor) to the lowest possible minimum. This means savings all around.



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Zerocel is one of the famous GOLD BOND products, well-known all over the world. That's why your appliances and installations will be easier to sell if they bear Gold Bond Zerocel stickers and job signs. They're FREE on request.

ZEROCEL PROPERTIES:

- Completely fireproof
- Will not absorb moisture or odors
- Will not settle
- Immune to fungus, rot decay, and vermin
- Light in weight
- Easy to cut with knife

Zerocel is manufactured to U. S. Dept. of Commerce Standard CS 105-43. Samples and literature on request.



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AMINCO OIL SEPARATORS



Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from $\frac{1}{2}$ H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

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Complete Stock
Prompt Shipment

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GENUINE FACTORY REBUILT UNITS

\$39⁹⁵

EXCHANGE
PRICE!
ALL MODELS
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Grunow
AUTHORIZED SERVICE, INC.

4313 W. Fullerton Avenue, Chicago 39, Illinois

GUARANTEED 6 months
One-week service!

Send in your old unit board. Just unfasten suction and liquid line, loosen the bolts holding the board and ship complete. All we ask is that the pumps are in fair shape and all parts are with them.

ALL GENUINE GRUNOW PARTS
STILL AVAILABLE

Stators—thermostats—relays—meters—
condensers—electrolytic condensers.

FACTORY TESTED PARTS

SODA FOUNTAINS . . .

Continued from page 36

Liquid 5'6" and 6'6" Bobtail units Models 4131 and 4132 were factory equipped with a 1/3 H. P. Liquid-Brunner close-coupled condensing unit.

Refrigeration Circuit. The refrigerant passes from the receiver on the condensing unit thru a combination dehydrator-liquid indicator thru a TEVF207 (or MX6AC) thermostatic expansion valve to the syrup rail. From the syrup rail the refrigerant passes to the water bath through a rear wall evaporator, crossing over to the front wall water bath evaporator which also acts as the driver coil and out thru the suction line to the compressor.

The thermostatic expansion valve is factory set for 10° superheat. The



bulb of the thermostatic expansion valve is clipped to the third tube from the top on the front wall evaporator.

Electric Current. These condensing units are equipped as standard with 110-220 volt, single phase, 60 cycle, AC motors. They can be adapted to any current or cycle by changing the motor. A combination toggle switch-junction box is supplied installed directly under the White-Rodgers control and is connected by BX cable to the motor.

Electrical connections to the junction box must be made at the time of installation in accordance with the local electrical code. The toggle switch permits manual control of the unit for servicing.

Condensing Unit. The condensing unit used on both the 5'6" and 6'6" bobtails is a special close-coupled

Liquid-Brunner machine, No. LC-661.

The condensing unit is equipped with a 1/3 H. P. Wagner capacitor type motor with built-in overload protection for use on either 110 V. or 220 V., AC current. It has a high capacity shrouded condenser and large receiver. The receiver is equipped with a fusible plug and has a refrigerant capacity of 11 lbs. F-12.

The silica gel combination dehydrator-liquid indicator is installed on the outlet side of the receiver in the liquid line. A shut-off valve is provided in the liquid line to permit

pumping down and service operations on the expansion valve or replacement of the dehydrator.

Four resilient rubber mounts are used to absorb condensing unit vibration. The machinery may be pulled out for service operations on pull-out rails. It is equipped with a flexible liquid and suction line (pull-out) coil made up of 1/4" liquid line and 3/8" suction line spot soldered together to act as a heat interchanger.

Control. The condensing unit is controlled by a White-Rodgers No.

MODERN REFRIGERATOR HARDWARE



Manufactured by
NATIONAL LOCK COMPANY
Rockford, Illinois

1609 (or No. 1634) temperature control. The bulb is held in a stainless steel clamp attached to the back wall evaporator in the water bath on the fourth tube from the top.

A wall of ice should form on the front and rear evaporators in the water bath. The approximate settings on the temperature control will be 24° cut-out and 30° cut-in. The settings required will vary depending on water load conditions.

On any Liquid Bobtail connected to its own condensing unit, whether self-contained or remote, the best type of

control is by means of a temperature control.

However, if a Bobtail is duplexed with an ice cream cabinet or other lower temperature fixture, a TRV-20, TMV65 or AP235 suction control must be used to regulate the ice formation in the bobtail water bath, with condensing unit control being taken from the temperature control on the ice cream cabinet. A check valve should be installed in the suction line from the ice cream cabinet for best operation.

Refrigerant Charge. The refrigerant

charge for the 5'6" and 6'6" bobbails is 5½ lbs. F-12. These units are equipped for use with F-12 and are shipped completely charged with refrigerant.

Start Up and Initial Pull-Down. This unit will require approximately 6 hours for the initial pull-down.

To start up:

- (1) Open compressor discharge service valve wide.
- (2) Open compressor suction service valve wide.
- (3) Open the liquid line shut-off valve wide.
- (4) Check for F-12 leaks.
- (5) Start the condensing unit by moving the toggle switch to the "on" position.
- (6) Check the setting on the temperature control.
- (7) After about 15 minutes operation, fill the water cooling section with cold water to about even with the top of the soda and water cooling coil.
- (8) Fill the syrup rail with cold water to the level of the overflow.
- (9) Check for "full" liquid flow through the liquid indicator, and add gas if necessary. With machine operating, if sufficient charge is in system, flow will be "clear."

Loss of Refrigerant. On these 5'6" and 6'6" Bobtails, a shortage of refrigerant due to leakage will show up in little or no ice on the front water bath evaporator, which is the end of the series refrigeration circuit for the unit. Under these conditions excessive ice may form in the syrup rail, and the unit may operate continuously.

Locate and eliminate the F-12 leaks and then add refrigerant to the system.

An expansion valve which is not open wide enough or a plugged expansion valve inlet screen will cause this same condition. Readjust expansion valve part of a turn at a time.

A temperature control set too warm will also result in little or no ice on the front evaporator.

SERVICE SHOP IN B. C.

F. C. Stewart has opened an electric refrigeration service and electrical repair shop at 301 Nelson Ave., Nelson B. C., Canada, under the name of "Pete's Refrigeration & Electrical Repair Service".

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YEARS of research, specially designed equipment and an exclusive patented process are responsible for the quality, precision and accurate sizing and forming of NIBCO WROT Fittings, Return Bonds and Special Tubular Parts. They are always uniform . . . every fitting is "round and square." Impervious to gases, unaffected by vibration . . . they're just what you've been looking for in your work. Get acquainted now.

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Are you fighting
HIDDEN
REFRIGERANT
LEAKAGE?
Spot it immediately with
VISOLEAK

VISOLEAK detects even the smallest leaks before they cause damage to expensive refrigeration systems. Years of use prove it safe, economical, easy to use.

NEW CHARGING SET

The VISOLEAK Charging Set was developed to inject VISOLEAK, add refrigerant oil or re-charge sealed units. For use on all types of refrigeration systems without danger of introducing air or foreign matter.

Charging Set—

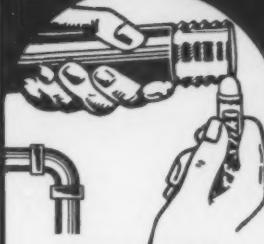
complete with hoses.....\$7.50
Filler only—without hoses.....6.00

See your refrigeration supply jobber or write for complete information.

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NOW-PIPE JOINT COMPOUND in Stick Form



NO LEAKS!

Just rub 3 or 4 strokes across pipe threads. It spreads and fills threads when turned.

Note these FEATURES

- ★ Withstands Freon, methyl chloride, butane, propane and other refrigerants, oil, air, water, brine, etc.
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- ★ Contains no lead. Contains no injurious ingredients.

Lake Chemical Company

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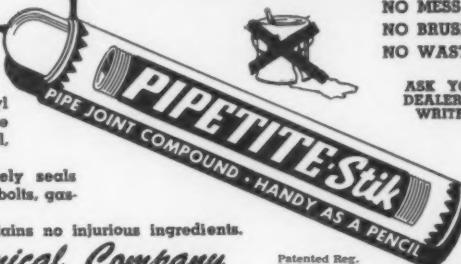
FOR ALL THOSE PIPE INSTALLATION AND REPAIR JOBS

Always Ready For Instant Use
ECONOMICAL
HANDY . . . CLEAN

Tested and Fully Approved by Independent Laboratories and Industry.

NO MESS
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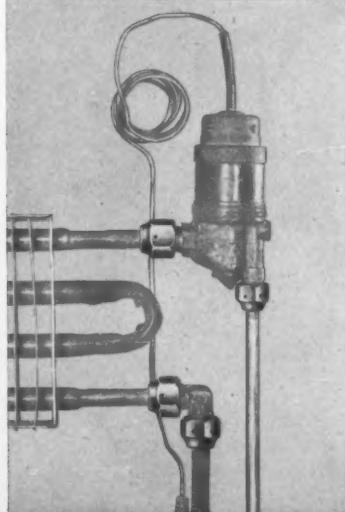
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DEALER OR
WRITE US



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Corpr. 1943
Lake Chemical Co.

STA-TITE THE REFRIGERATION FLARE NUT which cannot Creep or Work loose



Moisture will work its way along the threads, to fill the space between the fitting and the inside of the flare nut. Confined in this space, the water, in its attempt to freeze during the operating cycle, develops a tremendous pressure—16,400 p.s.i. at 20° F. Something has to give at such high pressures . . . (1) the nut may stretch, (2) the male fitting may collapse, (3) the copper tube flare may extrude . . . any one of which will allow the flare nut to loosen. You know the rest—moisture in the system and/or loss of refrigerant. A condition which has long baffled the refrigeration industry.

NOW—Superior engineers have found a positive cure—the new "STA-TITE" Flare Nut. By simply providing relief openings in otherwise standard flare nuts, the possibility of pressure being created is entirely eliminated . . . the flare nut stays tight!

Thousands of "STA-TITE" Flare Nuts already in service have yet to show a single failure. Moisture trouble, costly and annoying leaks, because of so-called "creeping" flare nuts, have been eliminated completely.

Get "STA-TITE" Flare Nuts from your jobber. Use them on all connections which are subject to frequent or occasional frosting and defrosting. Banish "creeping" and leaks forever!

"STA-TITE" is another Superior contribution to better refrigeration!

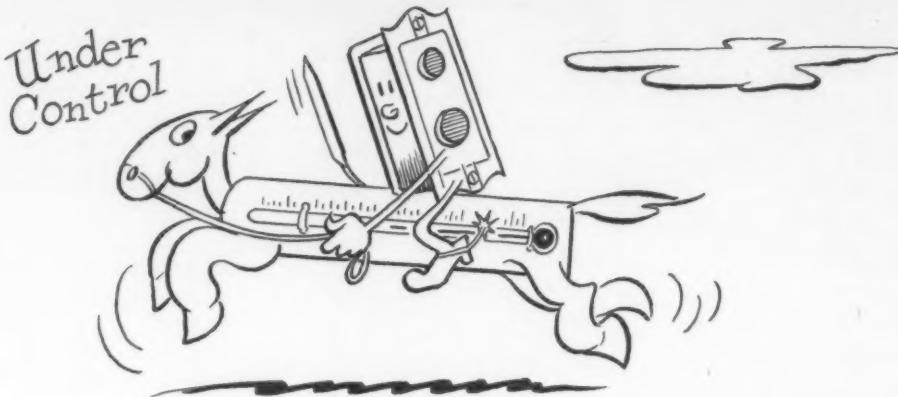
U.S. Patent 2,323,099



NO.134

SUPERIOR VALVE & FITTINGS COMPANY
PITTSBURGH - 26 - PENNSYLVANIA

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FOR COLD PRECISION

**It's RANCO — Both as to Construction
and Refrigeration Control**

Yes—Ranco keeps refrigeration temperatures under control.

That is because—each part of each Ranco refrigeration control is precision inspected through every step of assembly.

It is this precision which give Ranco controls their sensitivity . . . their positive and accurate temperature control.

It is this precision that brought to Ranco one of the most exacting temperature control construction jobs in history . . . a control for the most highly developed anti-aircraft gun in World War II . . . a gun which proved itself during the war.



If you want the best in performance

SEE YOUR RANCO JOBBER



Ranco Type "O" Temperature Commercial Controls. Range screw changes cut-out and cut-in together. Differential screw changes cut-out only. Rating without magnet: 1 H.P. 110 or 220 volts a.c. Rating with magnet: 1 H.P. 110 or 220 volts a.c. $\frac{1}{2}$ H.P. 115-230 volts d.c.

Ranco Inc.

COLUMBUS 1, OHIO

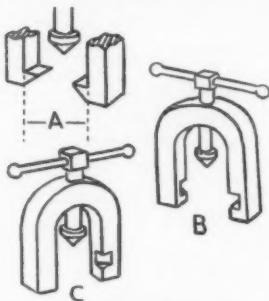
"Let's share our knowledge—exchange our experience"

Here's how

New Vapor Seal

One of the many new developments of interest to refrigeration men is a cold application vapor seal for frozen food and ice cream cabinets and for milk, water and beverage coolers. The manufacturer claims that the seal can be troweled to a cement wall, and can be painted after it has set. The seal then remains flexible, not affected by expansion or contraction.

HERE'S how to convert the conventional old-style yoke into one that will slip over the bar, and



with a slight clockwise motion will slip into position. Grind or saw off at points indicated at "A"; then file notches about $\frac{1}{4}$ -in. deep as shown at "B" and "C."

Milton Smoyer, Kansas City, Kan.

Cylinder Check-Ups

One of our companion departments, "Over the Counter", has had some interesting and very valuable material in it during the past couple of issues on the "why" of refrigerant cylinder testing. To add our bit to those discussions, here are a couple of pointers to keep in mind:

Weigh all your service drums, empty, and stamp their weight on the cylinder. In this way you can always check on whether a cylinder is over-

Edited by
Warren W. Farr

charged by weighing it and adding the allowable weight of the particular refrigerant to the known weight of the cylinder.

Keep your cylinders tested and dated by an approved I.C.C. testing station. This will pay you dividends in time and money, for it will insure your cylinders being filled promptly when you take them in to your supplier.

NOT long ago I was called upon to replace a broken oil sight glass in a not-too-popular make of compressor which was used to refrigerate a battery of six cafeteria walk-in boxes. The most readily available substitute was a piece of Lucite, so I used it. The material was easy to cut, and is still working satisfactorily.

David Leger, Washington, D. C.

Rapid Solvent Cleaner

A new solvent cleaner, recently put on the market, is said to be quick and effective in removing grease, oil,

FIVE DOLLARS REWARD

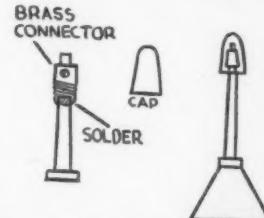
WILL BE paid by THE REFRIGERATION INDUSTRY for any information on installation or servicing procedures and shortcuts accepted for publication in HERE'S HOW, The Service Man's Department.

Send your suggestions on shop equipment and methods, tools, or other ideas to HERE'S HOW EDITOR, c/o THE REFRIGERATION INDUSTRY, 1240 Ontario St., Cleveland 13, Ohio.

carbon, grit and miscellaneous shop dirt from metal parts. At the same time, the solvent cleaner is said not to be harmful to metal surfaces or operators' hands, and to be without toxic or irritating fumes. The product is completely miscible, and will combine in kerosene or other hydrocarbon diluent; it emulsifies in a water rinse. Known as "Optimus Solvent No. 2", the cleaner comes in 15 and 55 gallon drums.

TO PREVENT oil from leaking out of the spout of the oil can, when you are carrying one in your tool kit, I find that the following arrangement does the trick:

One Mar (electric wire) connector, with the brass part of it soldered to the end of the spout, is all you need. Screw the cap part



on, and the can won't leak, even when it is laying on its side in your kit.

The connector, in case you're unfamiliar with it, is a two-piece unit with a brass insert and set screw, and with a threaded bakelite insulator (which you use for the "cap").

Arthur Oschetsky, Paterson, N. J.

Diagnosing Trouble On Water Coolers

If the control on the water cooler appears to be at fault, make a systematic check of it. Here are some things to look for:

A. Dirty or pitted contacts. Clean the contacts, or if this is not possible, replace the control.

THE SERVICE MAN'S DEPARTMENT

B. Main contacts remain open. This indicates a discharged bellows. If the bellows is leaky, replace the control.

C. Erratic operation. Check to see if the bulb is loose in the well.

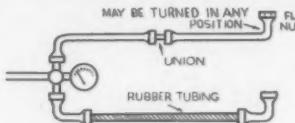
D. Toggle binding. If the toggle cannot be made to operate, replace the control.

E. Loose wiring. Check all wiring and terminals and tighten if necessary.

F. Control mounting loose. Tighten mounting screws if the control mounting seems to be loose.

TO KEEP from bending the tubing when connecting the pressure gauge, I installed a flare union in the middle of the tube. By loosening one nut, the tube can be turned to any desired position. This way, you have one rigid and one flexible connection.

M. R. Pielstick, Buhl, Idaho.



Airserco PRODUCTS THE TRIPLE ANSWER TO MANY SERVICE PROBLEMS

Here's help in speeding up your road calls! The Airserco Analyzer quickly starts up hermetic and open type units by creating fifty-six starting combinations. Electric motors and units up to $\frac{1}{4}$ HP tested under actual working conditions. The Airserco Analyzer may be left on the job for emergency service and the unit permanently repaired later by supplying a starting kit derived from the dial and weight readings. The "KNOW-HOW" is built in. Complete with cords, calibrated weights, fabric carrying case and instructions.

Model EJ.....\$125.00



3-WEIGH
HOLDER



THERMOSTATIC CONTROL TESTER

The Airserco Thermostatic Control Tester is a must for every refrigeration service engineer because: (1) It indicates quickly cut in and cut out temperatures; (2) does not require removal of control from cabinet; (3) eliminates unwanted tampering with thermostatic controls; (4) shows customer defective part. It comes complete with leather pocket case, instructions and bulb adapter. Fully guaranteed.

Model A100.....\$19.50

The Airserco three-weigh holder facilitates the use of the control tester and eliminates that tank holding hazard during a unit charging operation. The three-weigh holder quickly indicates correct amount of refrigerant used from 4 oz. to 10 lb. The cylinder is free to move in any position during the charging operation. Complete with bench and tool box flanges and instructions. Fully guaranteed.

Model JC.....\$12.50

SEE YOUR JOBBER OR FOR MORE "KNOW-HOW" WRITE

AIRCRAFT SERVICE COMPANY

435 MELWOOD STREET • PITTSBURGH 13, PA.

Tube Flaring: Right and Wrong

The following worthwhile pointer on the right and wrong way to flare refrigerant tubing is from Wolverine Tube's recently issued booklet, "Tube Trails".

"Flaring of tubing is one of the most important operations in making joints or connections in refrigeration work.

"Though it is comparatively simple to flare tubing, the operations used separate themselves into the typical trends of all things, namely the right way and the wrong way.

"The wrong method (and the most widely used) is as follows:

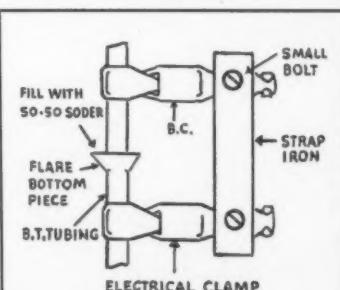
1. Cut the tube to length.
2. Disregard the burr from the cutting operation.
3. Endeavor to flare the tube.

"Results—The thin burr section is the first to be cold worked during the flaring operation and results in cracking of the tube. A crack, once started, travels into and through the tube wall, leaving the whole flared section useless.

"The proper method is as follows:

1. Cut the tube to length with a hacksaw or tube cutter.
2. Remove burr with a knife or sharp cutting edge.
3. Accomplish actual flaring by using a standard flaring tool.

"Result—A clean, perfect flare, which will contribute to a leak-proof joint and a good sound connection."



HERE is an idea that will help the man servicing soda fountains. Block tin is hard to solder at times and sometimes requires the help of another person to hold the fittings, etc., in place while being soldered. I have rigged up a tool to hold two pieces together when doing the job and also to hold the fitting in place. Two electrical clips and a piece of strap iron is all that is needed. Here is a simple diagram of the tool and the way it is used.

W. R. Addison, Charlotte, S. C.

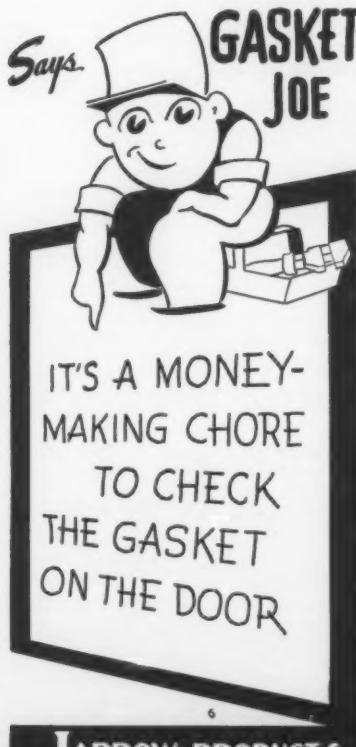
THE BEST TEACHER . . .

Continued from page 42

This ties-in with the point just enumerated, and it's a sort of "which came first, the chicken or the egg?" proposition. In this instance, it is being assumed that the interest in frozen foods must be created first, after which the interest in larger storage capacity (to be met by the home freezer) will follow. But, in either case, to do this job effectively requires sales-minded men—the kind who look ahead of the immediate sale of one or two packages and visualize the day when most, if not all, of the fruits and vegetables going into the home will be of the frozen variety.

5. Establish service requirements, and set the standards for them.

Home delivery of frozen foods is a major item in this category. Will the market justify it? And how far should the neighborhood frozen food store be prepared—or willing—to go? Recognizing that before too long there may be competition from city-wide operations offering home



JARROW PRODUCTS
420 N. LA SALLE ST., (CHICAGO 10, ILLINOIS)

MAY, 1946

delivery, the present prospect lines up about like this: home delivery can be undertaken profitably if (a) a minimum quantity (or dollar figure) for purchases is established, and (b) if deliveries are limited to once or twice a week.

Busy Twilight-Times

Friday and Saturday are the peak days, as far as sales are concerned, the store has found; and daily peak hours are from about 3 to 6 p.m.

Regular store staff of four persons is augmented by two "extras" for those periods; night hours (to 9 p.m.) have been tried, successfully. This summer, the store plans to furnish customers with insulated bags, to insure their purchases getting home in A-1 order.

A rather interesting variation has been noted in the shopping hours and amounts purchased by families who own home freezers, as compared with those who don't. Persons who have

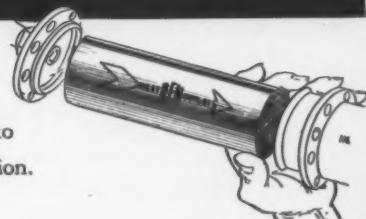
SERVICING THE DFN SYSTEM IS A MATTER OF MINUTES



Just open a flange—remove old cartridge—
slip in a new one—bolt it up.

YOU HANDLE ONLY ONE PART ...The DFN Cartridge

It is ready-to-use. Drying agent, strainer and filters are all factory-assembled. Hermetically sealed to preserve full strength dehydration.



In addition to fast, easy servicing, DFN is the only complete system of protection against clogging, freezing and corrosion. It is a dehydrator, neutralizer and strainer-filter, all in one. Its exclusive strainer-filter assembly holds more

sediment without pressure drop, thus stays on the line longer. Ask your distributor about the DFN system or write for Catalog R-7.

McINTIRE CONNECTOR CO.
257 Jefferson St. Newark 5, N. J.



Let's Talk About BEARINGS!



Wagner Used Bronze Bearings in 1891.

They were the best bearings obtainable at that time. We continued to use them until the more compact and powerful modern driven machines imposed higher bearing loads on our motors.

In 1927 Wagner Pioneered the Bimetal Bearing Which Permitted Higher Bearing Loads.

This Bimetal bearing had a steel outer shell for strength and a high tin babbitt lining for a superior bearing surface. Destruction tests by belting together two identical motors, one equipped with bronze bearings, the other equipped with Bimetal bearings, showed that the Bimetal bearings resist seizure and operate at lower temperatures than bronze bearings.

World War II Necessitated Increased Research.

Tin became scarce . . . Modern Bronze bearings were again considered but finally a Bimetal bearing having a lining of antimony lead babbitt containing a small percentage of tin was selected for its superior performance.

PROVE IT TO YOURSELF!

Take a Standard Wagner Diamond Bored Fully Finished Bimetal Bearing —

You will find that it is not necessary to line ream or otherwise machine it if you install it in an endplate in the following manner.

1. Use a snug fitting mandrel or motor shaft.
2. Press it in.
3. Assemble motor.
4. The motor will be ready to run.

Bimetal Bearings for Undersize Shafts.

These Bimetal bearings are available unbored for use on undersize shafts within reasonable limits.

They should be line reamed to fit the desired size.

These Bearings Are Available for Immediate Delivery.



Every motor repair shop needs this catalog. It helps you determine the catalog number and price of Wagner fast-moving motor parts. Ask for Catalog MU-40 today.

Genuine Wagner motor parts are available at 325 authorized service stations displaying the sign pictured at the left.



M46-10

Wagner WE Electric

6442 Plymouth Avenue, St. Louis 14, Mo., U. S. A.

home freezers, the store has found, do their shopping early in the day—anywhere from 8:30 a.m. to noon; and they do their buying once a week twice at the most.

For non-owners of home freezers, the hours around meal times—10 a.m. to 2 p.m. and 4 p.m. to 9—seem to be the most popular. The families with freezers will buy from \$9 to \$21 worth of frozen foods a week; non-owner purchases, of course, won't run that high. But the average sale is higher during off-peak hours. Studies have shown that the average sale, which amounts to about 87 cents when the store is crowded, goes up to \$1.57 when there are fewer customers in the place.

Companion Products

Another interesting fact has developed from the studies: in a frozen foods store, ice cream is a food, not a specialty item. Sales figures indicate that it is a natural tie-in. Milk, butter and other dairy products tie-in well, too.

Getting back for the moment to the 80 feet of frozen food sales cabinets, these are fitted with Yoder plates, and were built to order. Refrigeration for them is supplied by three 1 H.P. condensing units. In addition to the low temperature cabinets, the store has a self-serve dairy case, served by a 1/2 H.P. machine.

For customers' convenience, such specialty items as coffee, sauces, olives, pickles etc. are stocked, but they figure only fractionally into the over-all volume. The important thing is that, through this store, significant facts are being learned about the possibilities of frozen foods and how to merchandise them—and these facts will help the sponsoring refrigeration firm in its sales of equipment to both retailers of frozen foods and to prospects for home freezers.

A new resin, known as BCM, announced by du Pont, may find a use in structural panels for refrigerators, washing machines, and other similar applications.

In tests which are now being made, the liquid resin is being used chiefly with glass fabric laminates, although it may also be applied to paper, hemp, wood and various cloths. In the cured state, it is said to be without odor and resistant to most organic materials.

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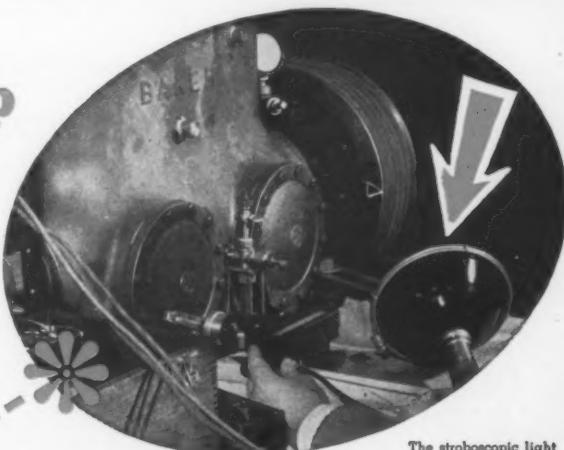
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SINCE 1905



Over the COUNTER

JIM: *Frank, what was that order you just wrote up for Bill Jones of Apex Service a few minutes ago?*

FRANK: Let me see . . . that was 1 seal, 1 strainer, 4 fittings, 3 gaskets, 1 belt, and 1 expansion valve.

JIM: *And how much money does that add up to?*

FRANK: Just a little less than \$18. But why do you ask?

JIM: *Well, I was just thinking that when Bill walked up to the counter and ordered that stuff it sounded for all the world like a young kid going up to the penny candy case in the corner confectionery and telling the proprietor "I want one of them, and one of them, and two of those".*

FRANK: *What are you driving at, Jim? I don't get it.*

JIM: *Take another look at that insignia on our door or on our letter-head. That says "Refrigeration Equipment Wholesalers Association." We're supposed to be selling refrigeration parts and supplies in wholesale quantities to our customers, the servicemen, who in turn sell this material at retail to the people whose refrigeration equipment they repair. And Bill Jones' order of 1 seal, 1 strainer, 4 fittings, three gaskets, 1 belt, and 1 expansion valve sure doesn't sound like wholesale quantities to me.*

FRANK: *Yeh, I see what you mean, all right. I've noticed lately too that our average counter sale seems to be much lower than it used to be. But what can we do about it?*

JIM: *Well, it seems to me that the whole problem is largely one of educating the servicemen and service companies who buy from us.*

FRANK: *Educate them in what way?*

JIM: *Well, we can't buy in piddling quantities like that, and every individual little sale means just that much more bookkeeping for us, so it's up to us to point out to our customers that it's not sound business practice for them to buy in such*

small quantities, either.

FRANK: *How do you mean, Jim?*

JIM: *Well, for instance take this Apex Service outfit. Every time Bill Jones drives in here to pick up another valve or a few more feet of tubing it means an extra trip for him. And that means valuable time, to say nothing of the added expense of the gas, oil, and general depreciation on his car. So why not just suggest to him that they could really save money by planning their buying a little better.*

All it would take is a little fore-thought, a little planning ahead and



"They cut our power off last week, could that mean anything?"

anticipating their needs on the basis of their past experience, and they could compile a list of what they need, just like my wife does for her weekly marketing. And then they could make one trip in here with a really worthwhile order instead of three trips to pick up just a few items at a time. And that way they'd be saving money for both of us.

FRANK: *But gosh, Jim, every order can't be a \$100 job. Most service businesses aren't set up for that kind of volume.*

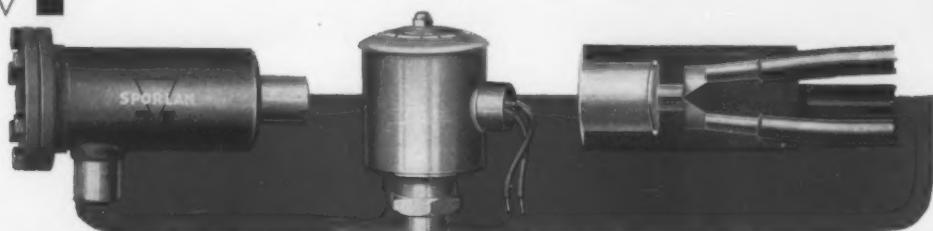
JIM: *No, of course not. But there is a happy medium, I think, that would work out better all around.*

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**SPORLAN
VALVE COMPANY**

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ABOUT PEOPLE . . .

Continued from page 39

of Penn's Milwaukee branch to succeed E. S. Kyle, who has resigned. Mr. Gray has been with the company's home office for a number of years.

Bernie G. Silberstein, manager of Ilg Electric Ventilating Co.'s branch office in Cincinnati, has been appointed manager of the company's

Ohio Valley District. In his new capacity, Silberstein will supervise engineering and sales activities of Ilg branches in Cincinnati and Columbus, Ohio, Louisville and Knoxville, Kentucky, and Charleston, W. Va.

Edward L. Schulz has joined the Gordon Lozier Corp., manufacturer and distributor of air conditioning, commercial and industrial refrigeration equipment, and store fixtures, as vice-president and director. Mr. Schulz recently resigned as branch

dealer manager for Carrier Corp.'s Cleveland office. In his new capacity Mr. Schulz will head the Lozier company's air conditioning and industrial refrigeration engineering and sales department.

Harvey H. Farber, vice president of Refrigeration Corp. of America since its organization, has been named directing head of a new department of that company which will concentrate on the national sale of ice cream cabinets. This is one of the steps the company is taking to expand its operations as a wholly owned subsidiary of Noma Electric Corp. Until recently, Mr. Farber was works manager of Refrigeration Corp.



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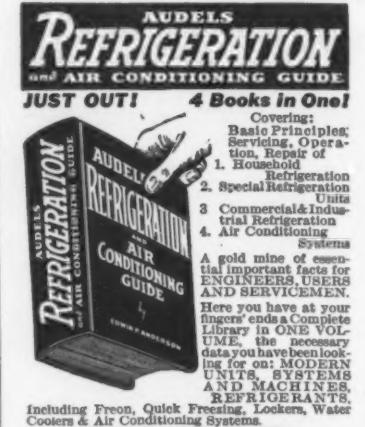


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R22

by Hillis D. Iams and Richard R. Seddon in Supply Distributors Corp., Boston parts and supplies wholesaler. Mr. Iams and Mr. Seddon have resigned as president and treasurer of the firm, and the new owners have announced their intention of installing new personnel and continuing the company's expansion along the lines originally planned by the founders.



for Army personnel.

Carl E. Jones has been appointed assistant sales manager of the Agaloy Tubing Co., with headquarters at the company's mill in Springfield, Ohio. Mr. Jones was formerly a naval lieutenant with the Aircraft Scheduling Unit at Wright Field.

Harold F. Stamps and John E. Law have been appointed field engineers for Henry Valve Co. Mr. Stamps, who will cover territory south and east of Chicago, formerly



Mr. Stamps



Mr. Law

was a Chief Petty Officer in the 13th Battalion of the Sea-Bees. Prior to his entry into the service he was a design engineer for a prominent Detroit architect and engineer. Mr. Law, who will cover territory north and west of Chicago, served during

the war as a Captain in the 25th Infantry Division.

Paul R. Dye has been named regional manager for all products of Admiral Corp. Mr. Dye was formerly sales manager for the Taylor Electric Co., radio and appliance distributor in Milwaukee.

Walter P. Davis has been appointed managing director of the

Indoor Climate Institute, with headquarters in Detroit. Mr. Davis had been serving as executive secretary of the Indoor Climate Council of Western New York.

Melvin C. Shaw has been named manager of the blower and compressor department at the Allis-Chalmers Mfg. Co., succeeding John Avery, who has resigned to become president of a blower corporation in Indiana. Mr. Shaw has been with Allis-Chalmers since 1914.

Temprite ACCESSORIES CUT OPERATING COSTS AND INCREASE EFFICIENCY!

The Temprite "Oilrite" automatic oil separator retains the compressor oil in the crankcase, permits the refrigerant to work at its true boiling point, increases heat transfer of the evaporator and prevents scored parts and burned bearings. Sizes from $\frac{1}{8}$ H. P. to 60 tons.



Oilrite Oil Separators



The Temprite accumulator interchanger traps and evaporates any liquid refrigerant that may spill over from the evaporator. A liquid line, suction line heat exchanger which increases system capacity and prevents damage to the compressor.



Accumulator-Interchangers

Temprite equalizer tanks eliminate short cycling of the condensing unit by storing refrigerant gas on the suction side of the system. Reduces wear on motors, belts and controls and also reduces power consumption.



Equalizer Tanks

Temprite two temperature valves assure accurate control of evaporator temperatures. Extremely rugged and extra sensitive, these valves have large capacity and a wide range of adjustments.



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CONTRACTORS

News • Activities • Plans

REMA HEAD PRAISES CONTRACTOR AIMS

Industry wide co-operation in the mechanical refrigeration and air conditioning fields is the public's surest guarantee of maximum service and high standards of equipment, according to H. F. Spoehrer, new president of Refrigeration Equipment Manufacturers Association.

He pointed out that harmonious co-operation between all branches of the industry result in better products, improved distribution and better relations with the domestic, commercial and industrial public.

As an example of how the public benefits through industry co-operation, Mr. Spoehrer cited the objectives of the recently organized National Association of Refrigeration Contractors. Among the chief goals set by the N.A.R.C. are:

1. Issuance of engineering data on refrigeration contracting problems.
2. Assist in marketing high grade

ACCORDING to figures from headquarters of the National Association of Refrigeration Contractors, the 400-odd member firms now in the organization employ more than 2500 refrigeration mechanics. Number employed by individual firms range from one to 30. More than 60 cities are represented in the present N.A.R.C. membership roster.

refrigeration material and equipment.

3. Encourage members to establish attractive places of business.
4. Elevate the standards of refrigeration installations.

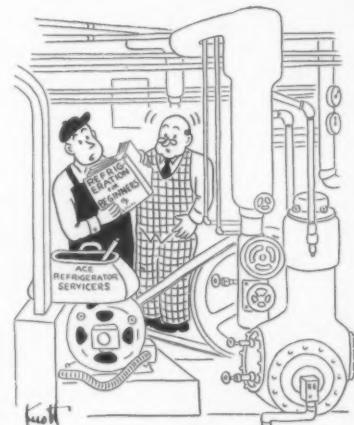
5. Co-operation with inspection authorities for the maintaining of proper standards and the development of licensing codes and ordinances.

6. Co-operation with municipal, state and federal governments in matters of public interest.

7. To distribute information to the public that will aid in obtaining best practice in refrigeration installations, including safety to life and property, permanency, adequacy, efficiency and economy of operation.

"The public will be the chief beneficiary of all of these objectives," Mr. Spoehrer stated. "Co-operation within this one branch of the industry is a good example of the friendly relations which exist throughout the entire industry to the advantage of the public, our customers."

Mr. Spoehrer declared that his association will do everything possible to assist the newly formed N.A.R.C. to achieve its aims.



"Now, let me see . . ."

Construction Curbed By New CPA Order

Under terms of an order effective May 26, no new construction or repairs, except for certain specified exemptions, may be undertaken without government approval.

No O.K. is required for residential property for five or less families, where the cost does not exceed \$400; for offices, stores, restaurants, warehouses, locker plants, etc., the exemption level is \$1000; for certain listed industrial establishments, the limit is \$15,000, with the latter not restricted as to maintenance and repair work.

According to the order, "repairing or installing repair or replacement parts in existing mechanical equipment in all kinds of structures, where no change in the structure is made," is not restricted.

One Contractor's Viewpoint

MANUFACTURERS of refrigeration equipment who are looking for ways to improve their product—and what manufacturer isn't—could incorporate in future models a number of design changes which wouldn't cause them too much trouble, but would permit installers and service men to do their part of the job more efficiently and easily. This is the opinion of B. F. Wood, of Woody Refrigeration Service, Des Moines, Iowa.

For the most part, Mr. Wood's "constructive criticism" has to do with the lack of standardization among the various parts now on the market. Here are his suggestions; maybe you have some additional ones you'd like to include with them:

1. High Sides

No drain plug or sight glass in crank case. Oil filler plug too small. Plugs should be SAE thread with copper gasket and located at accessible point. Liquid level test cock on receiver. Present method of belt adjustment is lousy. Use color code for refrigerant markings. Serial and model numbers stamped on name plates are too small to read. Do not mark refrigerant in pounds on this plate unless high and low sides are manufactured and sold as a complete unit.

2. Electric Motors

Standardize on shaft sizes for a given horsepower. Standardize bases and mounting holes. Improve oil cup so motor can be oiled quicker.

3. Sheaves or Motor Pulleys, and Fans

Use two set screws and balance pulleys. Standardize fan mounting holes for given horsepower. Improve fans to prevent breakage in use.

4. Low Sides

Hinge motor on blower coils so oiling of motor, and cleaning of finned surface can be accomplished without removing coil from the fixture. Improve outlet of coil so thermal bulb can remain at coil temperature and out of the draft or backwash of the air movement. (Expansion valve manufacturers will love you for this.) Improve drip pan to eliminate condensate on the bottom of pans which causes service men headaches. Increase pitch of drain pan to the drain hole so water can get away. Increase size of drain opening. Equip with heat exchanger. Use slotted hangers.

5. Expansion Valves

Decrease size or overall dimension of valves, standardize bulb sizes on 1-ton valves to fit thermal bulb wells. These wells take a $\frac{3}{8}$ " bulb. Standardize on $\frac{3}{8}$ " male flare inlet so $\frac{1}{4}$ " or $\frac{3}{8}$ " liquid line can be used without changing inlet fitting or using adapters.

6. Parts Packages

Reduce carton or package size on all temperature controls, valves, etc., so servicemen can carry more saleable merchandise in cars or trucks.

7. Water Vale and Temperature Control

Universal mountings or brackets to fit water valves and controls. Applying the above items are a pain to service men, and something should be done about it.

ARCTIC-TEMP APPOINTS PACIFIC DISTRIBUTOR

The Arctic-Temp Mfg. Co., West Coast manufacturer of frozen food lockers, has appointed the Collins Refrigeration Co., of Los Angeles and Oakland, as Pacific distributor of the units. Of reach-in type, the unit has 20-cu. ft. storage capacity (approximately 1000 lbs.), stainless steel cabinet inside and out, direct conduction built-in copper coils in each shelf except the lower one, and an "economizer" which allows flooding of the coils for quick heat transfer from food to refrigerant without damage to the compressor.

LOCKER SUPPLIERS GROUP ADDS TWO NEW MEMBERS

Two new contractor members—Valley Refrigeration Co., Tulare, Calif. and Reilly-Benton Co., New Orleans—have been added to the roster of the Frozen Food Locker Manufacturers & Suppliers Association.

U.S. RENEWS FOREIGN COPPER PURCHASING

Reconstruction Finance Corp. has announced that the Office of Metals Reserve is reestablishing a foreign public copper purchase program which was discontinued last October. Plans call for purchase of copper from foreign sources at the rate of 20,000 tons a month. The total quantity, 120,000 tons, is in addition to any commitment presently outstanding.

REFRIGERATION men, from present indications at least, are in for another tough summer. There are around 3 million commercial systems in use, and with production of new equipment set back by strikes and attendant materials shortages—to say nothing of existing equipment, now a year older—the problem of keeping 'em running through another hot season stands to be even more difficult than last year.

New equipment may reach the market in a trickle late this summer, but the wise contractor will practice conservation—probably he has been—for some parts still aren't too plentiful. The National Association of Refrigeration Contractors has asked its members for a report on those materials which are particularly scarce, so some relief may be forthcoming through that group. REWA is active in this respect, too.

HERE'S A LINE OF Compressor Oils



DEPENDABLE TO USE

Texaco Capella Oils assure smooth, trouble-free, economical operation for all types of compressors. They are highly stable and moisture-free, have very low pour tests, do not react with refrigerants and resist gumming and sludging. You can get them in every needed viscosity.

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Texaco Capella Oils bring you repeat business, increased sales and profits. They come in conveniently-sized, re-sealable containers that keep the oil in perfect condition—1-qt., 1-gal. and 5-gal. Leading manufacturers of air conditioning and refrigeration units use, recommend or approve them.

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TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT STARRING JAMES MELTON WITH HIS GUEST, ED WYNN—CBS

matic expansion valves on each brine tank evaporator. In the brine tank outlet, a frost valve was used. This valve consisted of a bellows charged with a freezing solution. As each evaporator became completely refrigerated and started to frost back, the frost valve bellows expanded and closed off at the suction line. This caused a reduction in pressure to make the valve at the next highest setting operate until it became completely refrigerated. One of the evaporators in the system was maintained at about 0°F., while the others ranged upward to about 25°F. Different freezing solutions were used according to the temperature range desired.

Another auxiliary valve intended to make automatic expansion valve multiple operation possible, among other things, was a superheat control valve developed by the writer in 1939. This valve was primarily intended to distribute refrigerant among multiple-pass air conditioning coils according to the actual load on each pass. However, it also made possible multiple operation of automatic expansion valves. Figure 4 shows such a system, using three evaporators.

In No. 1 evaporator, the automatic expansion valve is set to maintain a 20°F. evaporation temperature. All superheat valves in the coil outlets are set to maintain about 5°F. superheat at the coil outlet.

How It Operates

Starting from a warm condition, the whole capacity of the condensing unit works No. 1 evaporator until it becomes completely refrigerated, when the gas at SHV No. 1 is less than 5 above saturation temperature, which causes the superheat valve to throttle, reducing the suction pressure in the main suction line so that AXV No. 2 opens and No. 2 evaporator is refrigerated. As the gas temperature at SHV No. 2 approaches 15, it begins to throttle and cause the main suction line pressure to go down so that AXV No. 3 opens and the process is repeated. While the No. 3 evaporator is refrigerating, evaporators No. 1 and No. 2 are also continuously refrigerated as the superheat control valves tend to throttle gas through just fast enough to maintain a completely refrigerated coil. Individual cold control is readily ob-

THE PRACTICAL Refrigeration Engineering MANUAL . . . by Harold Smith

XII. Candy and Chocolate Processing

PART II

Because of the moisture problem involved it is of extreme importance for the boxes to be kept at the refrigerating temperature and in a low humidity air, to protect against this hazard. After the chocolates are packed and placed in storage there is little chance of humidity to affect the product.

Because of the air conditioning temperatures required in the conveyor belt tunnel and in the packaging room, both should be built with well insulated walls as a means of assuring efficiency, temperature control and economical refrigeration requirements. Usually forced draft convection units are used both in the packaging room and to circulate cool air through the conveyor belt tunnel.

ADDITIONAL COILS

In some installations, additional coils are placed within the tunnel to assist in maintaining the temperature required to cool the chocolate covering from 90°F. at the enrobing machine end of the conveyor, to 65°F. at the packaging room end of the belt. If this cooling effect is not accomplished, the candy will stick to the belt, as the chocolate will be soft and will not set. Fingerprint impressions will also be noticeable on the chocolate covering.

This, therefore, presents a situation requiring very accurate and correct engineering to provide capacity to set the chocolate while traveling on the belt, yet not lowering the temperature to a point which would cause discoloration of the product.

In the production of hand-dipped chocolates and in the processing of other candies, the

final dipping and shaping of the candies and box packaging is done in air conditioned rooms at temperatures between 60° and 65° F. These work rooms should be well insulated, and usually considerably more refrigeration is required to handle such spaces, as the heat used to keep the chocolate liquid is within the room.

Also, as a rule, more people are employed in the room when the hand-dipping method is employed. To offset this additional load, however, is the elimination of a refrigerated conveyor belt tunnel such as is required with the machine or enrobing process.

PACKAGING PROBLEMS

The same low humidity requirements are a part of this production and packaging operation. As stated earlier in this chapter, a refrigerated storage cooler is usually required to store products used for manufacturing, such as nuts, creams, fruits, etc. The requirements for this equipment are more or less standard for storage cooling, other than that temperatures from 35° to 40° F. are usually adequate to properly preserve these materials before they are used.

In designing the conveyor belt tunnel, an opening at each end is provided to handle the chocolates on and off the belts. These openings should be adjustable from 1" or 1½" above the belt to 5" or 6" to provide for large pieces, such as chocolate eggs made at Easter time.

KEEP NARROW OPENING

The opening, however, should always be kept as narrow as possible. The loss of temperature with a narrow opening is con-

tained in a system of this kind by simply adjusting the automatic expansion valve setting to raise or lower the evaporation temperature as desired.

Valve Construction and Service

All automatic expansion valves consist of a pressure responsive member—a diaphragm or bellows, a throttling valve, and a means of connecting these elements. A manual adjustment, consisting of an adjustable spring force against one side of

siderably less than when the opening is enlarged.

The tunnel should be insulated. Four inches of insulation is ideal, but often only 2 or 3 inches is used which increases the heat leak and necessitates larger refrigeration requirements.

Usually a forced-convection cooling unit is used with the tunnel, circulating the air over the chocolates as they travel along on the belts. The air is returned to the unit by a by-pass duct from the packaging room end of the tunnel to return the air to the unit cooler for recooling. This provides a complete cycle of circulation.

LOAD CALCULATIONS

In establishing the refrigeration load for air conditioning in the packaging room it is only necessary to ascertain the amount of insulation in the walls, the number of people working in the room, the added heat from lights, infiltration, and opening and closing of doors to establish these load requirements.

If several people are employed in these rooms, provision should be made for occasional ventilation of the rooms. This can be handled by grills with shutters manually operated as needed.

In hand-dipping rooms heat is present to keep the chocolate at the proper working consistency. This heat adds considerably to the refrigeration requirements. Usually a single burner gas-plate at each dipper's table keeps the chocolate bath warm and at the proper consistency for dipping.

EMPLOYEE FACTOR

The number of people employed for dipping and packing must be ascertained, together with the number of heating units, lights and other heat factors.

The room temperature should not be higher than 70° F. Ventilation must also be taken into

the flexible element, also is embodied in most valves.

The means of correcting the flexible element to the throttling valve, which is usually of needle-valve type, is usually accomplished as follows:

1. By using a yoke which is connected to the flexible element and the needle and straddles the valve seat.

2. By two or more pins which transmit motion from the flexible element to the needle, and which are located around the valve seat.

3. By a pin or connecting element

consideration as a necessary part of the equipment for these rooms.

The storage room for packaged merchandise should be held at a temperature between 60 and 65° F. The packaged products remain in this storage cooler until ready for shipment.

STANDARD CONDITIONS

As previously stated, the refrigeration load and equipment for the cooler in which materials are stored before being used, and for the packaged storage cooler, are figured the same as all standard coolers, using all the factors involved to arrive at the refrigeration requirements. These two coolers may be operated with individual condensing units, or with one condensing unit operating both rooms.

Where one condensing unit is used, a room thermostat in each room should be used to control the individual room temperatures by the use of solenoid valves connected in the liquid line. Forced-draft convection units are usually used for cooling these rooms.

UNIT SELECTION

Usually units are selected with the desired capacity based on 20 to 25° temperature difference to hold the relative humidity at from 50 to 65° F. The most difficult part of the refrigeration engineering involves the load requirements in the conveyor belt tunnel, in the packaging room and in the hand-dipping room.

We will set up as an example a small plant with an enrobing machine operation, together with hand-dipping, to outline in detail the steps required to develop the load requirements for an efficient refrigeration installation.

Editor's Note—Typical load figures for a candy processing application will be presented in next month's issue.

which passes through the valve orifice itself, transmitting motion from the flexible element to the needle itself.

4. By transmitting motion from the flexible element to the needle through a leverage or bell crank action.

Automatic expansion valves, although simple, are subject to a number of service troubles. These are listed in a beginning-to-end approach, as follows:

1. *Plugged screens.* Most valves have a screen in the inlet which may become plugged. This may reduce suction pressure below normal, if partially plugged, or cause a complete stoppage. If only partially plugged, the frost line on the valve is usually noted at the screen location rather than at the orifice location. Plugged screens are due to dirt, sludge, or in some cases to a sort of vaseline-like breakdown of oil in the system, in which case the screens are transparent and may look to be clear. Plugged screens cannot be considered a fault in the valve, but rather a fault in the system.

2. *Plugged orifice.* A punctured screen or lack of a screen in the valve inlet may allow dirt to block the valve orifice itself. The remedy is to be sure the screen is o.k.

3. *Needle frozen.* Moisture in the refrigerant or oil which circulates through the valve may freeze out where the pressure and temperature is reduced in the valve, which is at the valve needle and orifice. If ice forms, blocking off the valve orifice, the effect is the same as a plugged opening, and the suction pressure is reduced. If the ice freezes in such a manner as to hold the needle open, it may cause a flood of refrigerant through the valve, causing a high suction pressure and a frost-back. Moisture removal (by driers or otherwise) is the answer to this trouble.

4. *Sticking needle.* The needle of the valve may stick in the closed position, causing low suction pressure; in the open position, causing high suction pressure and frost-backs; or may go from one extreme to the other. Principal cause of sticking is a gummy formation resulting from moisture and consequent chemical changes in oil and refrigerant, although sticky action can result from mechanical binding in the valve it-

self. The valve having the fewest sliding contacts is least subject to sticky action. Self-centering needles are helpful in eliminating drag between the needle and one side of the orifice.

5. *Leaky valves.* Leakage by the needle of the valve may result from improper alignment of needle and seat, by improper needle and seat surfaces, or, more commonly, from corrosion or erosion of the needle and seat. Both erosion and corrosion are minimized by use of the best materials. Erosion is probably due to dirty refrigerant, while corrosion is due to moisture and resulting corrosive action. Corrosion also may result from improperly used driers in some instances which put corrosive materials in circulation in the system. The best answer to corrosion is undoubtedly the most thorough drying job possible in new systems, plus care in preventing leaks or otherwise permitting moisture and air to enter.

6. *Moisture freeze-up at flexible element.* Valves may be frozen in either the closed or open position in a system in which there is no mois-

ture. In this case, the moisture is on the atmospheric side of the flexible element, and results from a continual breathing process which draws in comparatively moist air when the valve is cooled, and expels air with less moisture unless the valve warms up. The moisture thus extracted from the air builds up around the bellows or diaphragm and eventually freezes in sufficient quantities to prevent proper movement of the flexible element. This trouble is minimized by use of a breather cap over the adjusting screw so as to prevent the passage

of new air in and out of the chamber next to the flexible element.

7. *Refrigerant and air leaks.* Any valve leakage between the refrigerant passages and the atmosphere which allows refrigerant to escape or air to enter will, of course, effectively stop all refrigeration due to loss of refrigerant or excessive air and moisture in the system. Such leakage may result from poor gaskets, or improperly tightened plugs or connections, porous metal, or fractures in flexible elements.

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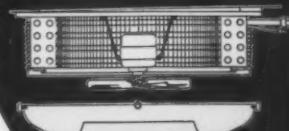
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OVER 450 members of Dayton Rubber Mfg. Co.'s "Ten-Year Club" were honored at the first postwar banquet of the organization held recently in the Biltmore Hotel, Dayton. Organized in 1937 with a membership of 147, the club this year initiated 54 new members. Fifteen members advanced from the 10 to the 15-year group, 20 were inducted into the 20-year group, and 19 members, including A. L. Freedlander, Dayton's president and general manager, joined the 25-year division.

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PARDON, PLEASE

We sincerely regret that in the caption beneath the picture of the new REMA officers and directors which appeared in our April issue the identifications of G. E. Graff and R. H. Israel were reversed. Our humble apologies to both these gentlemen . . . and a solemn word of admonition to our proof readers.

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